L30

MARCH 1, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

LOS ALAMOS SCIENTIFIC LABORATORY
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Reduce Plant Noise!

Less ear fatigue leads to greater productivity, lower accident rates, better hearing health — p. 94

✓ **LABOR ROUNDUP**
Unions Stress Security, p. 51

✓ **DEFENSE PLANT MOTHBALLING**
U.S. Studies Plan, p 53

When this man needs ALUMINUM

FOR IMMEDIATE DELIVERY

"When I need aluminum, I need it in a hurry. That's one reason I call KORHUMEL."

And he gets it in a hurry! Overnight, if necessary. Prompt, snag-free delivery is one of the cornerstones on which Korhumel was built. You can look forward to the same efficient delivery service when you call Korhumel. You can look forward, too, to saving valuable time and money, eliminating costly delays and meeting production schedules on time every time.

FOR COMPLETE STOCK SELECTION

"My needs vary. We use all sizes, types, gauges and alloys. That's another reason I call KORHUMEL."

It's a call well made, for Korhumel carries the most complete stocks available. Whatever quantity, size, type, temper, gauge or alloy of aluminum you need, you're pretty certain to find it in stock. Coils, sheet, rods and bars; each or all is quickly available. And don't overlook Korhumel's unique extra services. We will slit coils of all sizes or shear straight lengths to your most demanding specifications.

he calls KORHUMEL

why don't YOU?

FOR IMPORTANT SAVINGS

"We can't afford to carry large inventories. And that's just one more good reason why I call KORHUMEL."

And a mighty good reason, sir! Low inventory investment is just one of the savings you realize when you call Korhumel. You save valuable storage space for other purposes, cut costs on handling and lose less on damage and obsolescence. In addition, accounting costs are trimmed and you can get along with less insurance. Over a period of time, these multiple advantages add up to important savings.

STEEL
- Cold and Hot Rolled Strip and Sheet
- Spring Steel, Tempered and Annealed
- Feeler Gauge
- Round Edge Flat Wire
- Shim Steel
- Electro Galvanized Electrical Sheets
- Tin Plate
- Cold Finished Bars
- Tubing, Seamless, Welded
- Rigidtex Stainless Hydraulic Tubing

ALUMINUM
- Strip and Sheet Coils
- Straight Lengths Bars

PHOSPHOR BRONZE
- Coils and Flats

SERVICES
- Slitting
- Shearing
- Edge Rolling
- Bright Annealing
- Cold Rolling
- Ungerer Roller Leveling

KORHUMEL

STEEL & ALUMINUM

STEEL & ALUMINUM CO.

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Warehouses or Sales offices in Bridgeport • Cincinnati • Cleveland • Denver • Des Moines • Detroit • Grand Rapids • Indianapolis • Kansas City • Los Angeles • Milwaukee • Minneapolis New York • Rockford • St. Louis • South Bend

PERSONALIZED WAREHOUSE SERVICE

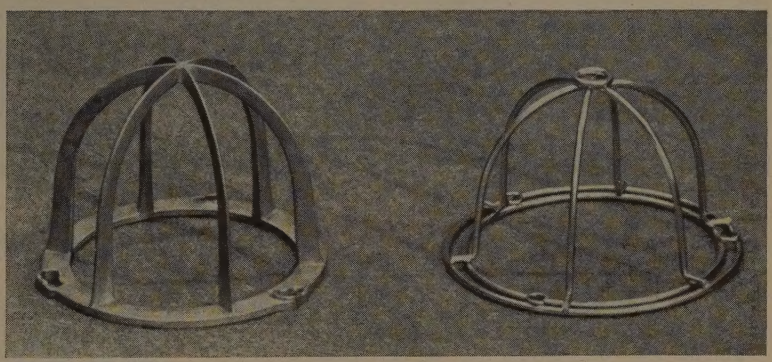
BETTER PRODUCT DESIGN WITH STEEL WIRE

LEGS FOR FOLDING TABLE – Attractively finished in black to resemble wrought iron, steel wire is welded to achieve a stronger, less costly construction than wooden legs. Steel wire is adaptable to a great variety of finishes.

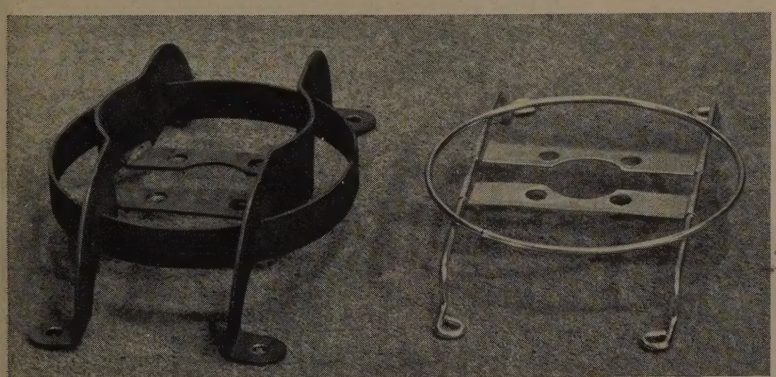
Steel wire can often solve a tricky problem in product design. Besides its eye appeal and great strength, steel wire often makes possible real savings, too. It's readily available and easy to fabricate.

In our modern wire mills we're turning out all kinds of steel wire – for cold-headed items, welded products, springs, gadgets, hardware, fasteners. Some are ordinary grades of wire; others are "specials."

Perhaps you have a design problem to which steel wire would furnish the solution. Let us help you select the grade that combines the strength, ductility and finish that the job requires. Phone or write the nearest Bethlehem sales office for complete information.



LIGHT GUARDS – The improved welded-wire design, at right, uses two concentric rings as a base, spaced to accommodate mounting bolts. Made from economical steel wire, the guard is stronger and less costly than the casting at left.



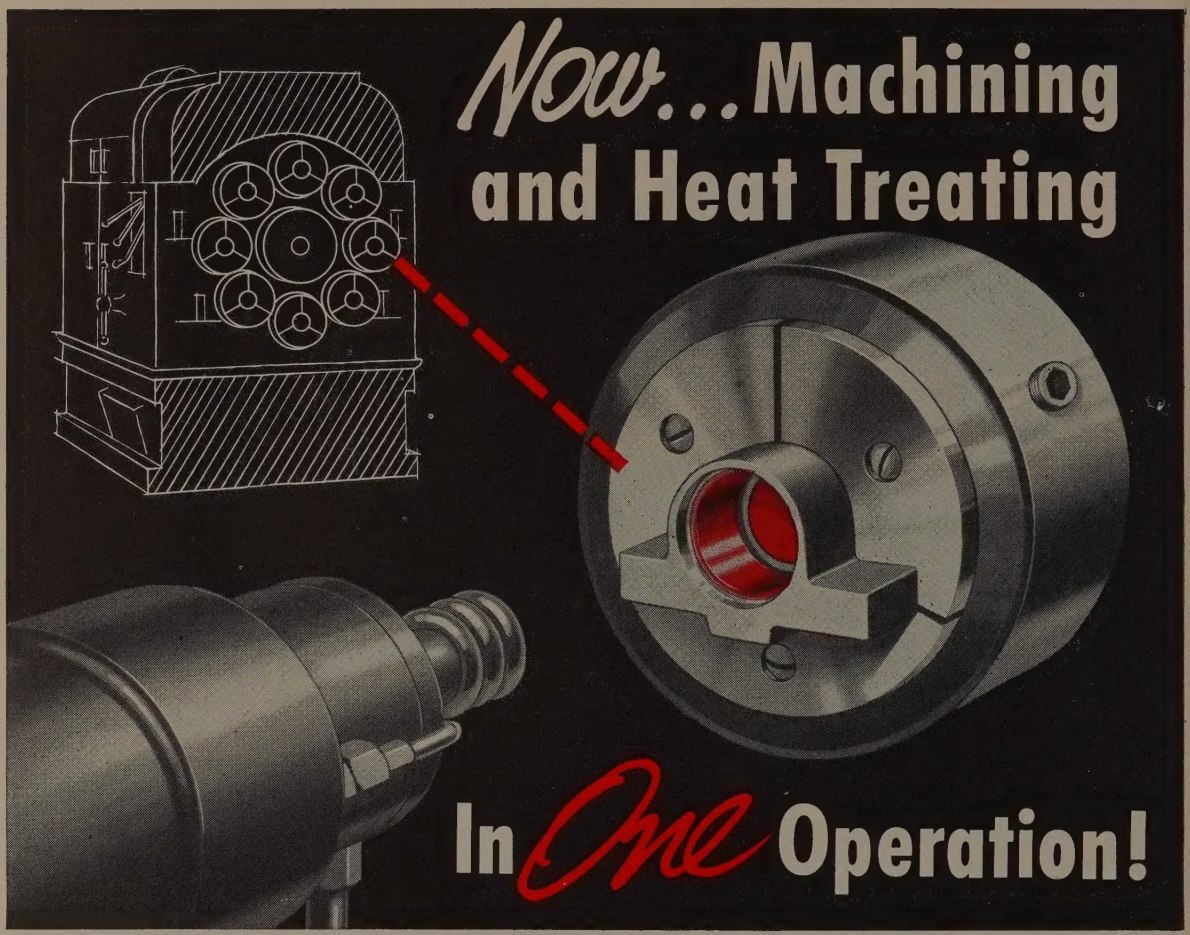
MOTOR MOUNT – Using spot-welded wire, the redesigned unit at right weighs only 12 per cent as much as the previous design at left. The use of steel wire greatly reduces the cost – and appearance is improved.

Photographs reproduced through the courtesy of E. H. Titchener & Co., Binghamton, N. Y., long a user of Bethlehem Wire. This firm specializes in the imaginative use of wire to simplify product designs and reduce production costs.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL



with TOCCO Induction Heating

Mechanics Universal Joint Division of Borg-Warner Corporation now combines automatic heat-treating and metal-working operations on the same machine!*

A Tocco Inductor Coil, matched to one spindle of a multiple spindle automatic screw machine, heat treats the inside diameter of automotive trunnion cups—after they have been completely formed on the same machine tool. Twenty-two, 20 and 50 kw, 450,000 cycle TOCCOtron Induction Heating units and 44 automatic screw machines (installed here and in other plants) make up this high-speed production team.

This new method permits the use of SAE 1144 steel and eliminates costly, time-consuming copper plating and carburizing operations formerly required. Heating and quenching cycles total approximately 10 seconds per part, and production is in excess of 300 parts per hour from each machine.

If your products or their components require heat treating, soldering, brazing or forging it will pay you to investigate TOCCO for better, faster ways of producing them at lower unit cost.

*This process developed and patented by TOCCO.

THE OHIO CRANKSHAFT COMPANY

TOCCO*

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-3, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

OSBORN

Here's better quality at lower cost . . . New Osborn Brushamatic No. 4 Machine. Handles metallic and non-metallic parts up to 100 pounds. Here, it is set up to deburr and blend teeth of sprocket.

Choose your weapons!

HOW are *you* going to answer the challenge of competition when it comes to your deburring and finishing operations? By hand? Or, by machine . . . with the Osborn Brushamatic? You'll far outclass the old manual deburring department in *quality* of work and in *economy* when you convert to Osborn's automatic power brushing.

At the push of a button, Brushamatic machines remove burrs and feather edges, blend surface junctures and clean parts thoroughly. Results are absolutely uniform . . . piece after piece. Scrap loss is nil. Service life of part is increased through elimination of stress-concentrating scratches. And it turns out work about *5 times as fast* as hand methods.

Find out how *you* can apply this modern method to *your* production. Call your nearby Osborn Brushing Analyst or write *The Osborn Manufacturing Company, Dept. G-16, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

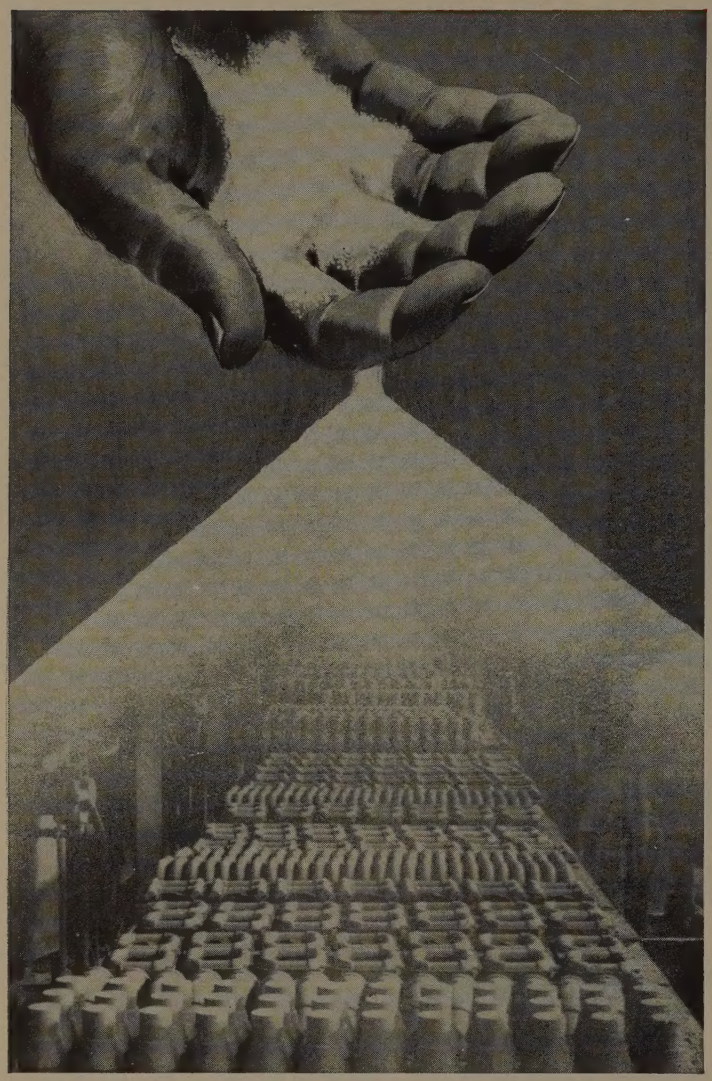
INFORMATION:
Write today for your copies of booklets on Automatic Deburring and on Brushamatic Machines.

SEE IT AT OSBORN BOOTH 627, ASTE SHOW.

Osborn Brushamatic

BETTER QUALITY... LOWER COSTS... AT THE PUSH OF A BUTTON

about Tenn-Sil sand additive



Try it! Ask your nearby TENNESSEE metallurgical engineer for a sample of Tenn-Sil sand additive. Discover for yourself how it will help you reduce casting defects.

Helps cut casting defects

● Foundries are finding TENNESSEE Tenn-Sil the key to better castings. This sand additive controls expansion in the mold and minimizes casting defects. It is available in two types:

Tenn-Sil No. 1 . . . replaces wood floor and sea coal in the sand mix. Graded to approximately AFA No. 100 size. By increasing hot deformation it helps eliminate defects such as rat tails, buckles and certain types of scabs. It is also used for insulating the molten metal in the ladle when delays in pouring occur.

Tenn-Sil No. 2 . . . replaces silica flour. It has a fineness of 325 mesh. It offers important advantages over silica flour for quality of cores and for steel facing. It has no free silica and therefore presents no silicosis hazard in itself.

Mail the coupon today for complete information on these products.

MAIL COUPON TODAY!

TENNESSEE PRODUCTS & CHEMICAL CORPORATION
Department S-3, Nashville, Tennessee

Please send data bulletin on new Tenn-Sil sand additives.

Name .....
Position .....
Company .....
Address .....
City ..... State .....

TENNESSEE PRODUCTS & CHEMICAL Corporation
NASHVILLE, TENNESSEE

Producers of: **FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS • WOOD CHEMICALS • AGRICULTURAL CHEMICALS**

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 9 March 1, 1954

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6 INSIDE REASONS

1 Helical, wear-hardened gears cut from alloy steel forgings and shaved before hardening for correct eccentricity and helical angle and bright, smooth surfaces — factors contributing to quiet operation and longer life.

2 Gear arrangement in simple train minimizes number of moving parts —promotes quietness.

3 Pinion and gear supported and spaced to reduce deflection—permits high load-carrying capacity.

4 Splash system with large oil reservoir assures constant and thorough lubrication of all parts.

5 Anti-friction bearing construction throughout.

6 Reliance *Precision-Built* Motors provide the maximum in dependable and economical power.

RELIANCE Precision-Built MOTORS

E-103

Write for GearMotoR Bulletin E-2404

Sales Representatives in Principal Cities

RELIANCE
ELECTRIC AND
ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

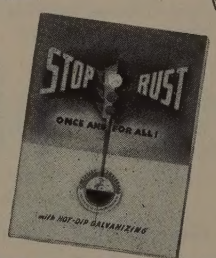
"All Motors are NOT Alike"

STOP RUST

once and for all

with HOT-DIP GALVANIZING

Send your iron and steel products to a member of the American Hot-Dip Galvanizers Association. His years of experience plus collective know-how assure you of a top quality job—if it's iron or steel have it Hot-Dip Galvanized.



Send for Free Booklet

American Hot Dip Galvanizers Association
1507 1st National Bank Bldg., Pgh. 22, Pa.
Print
Name_____
Firm_____
Address_____
City_____ State_____

behind the scenes

The Auto's Here To Stay

Taint Necessarily So, the renowned Chinese philosopher, was once overheard saying, "You can take a man's wife and he will thank you; take his car and he'll spank you."

The 1953 edition of *Automotive Facts and Figures* (quoting statistical data for the year 1952) gives ample evidence to support this claim that man and his automobile are not soon parted. For example:

Vehicular mileage traveled, 500 billion miles . . . 28 per cent of the vehicles involved were 11 or more years old . . . highway users paid $5⅓ billion in special taxes . . . 31 million families own cars . . . three out of every four cars sold replaced cars being scrapped . . . 29 per cent of drivers (?) are women; (*they control the other 71 per cent from the back seat*) . . . more than 9½ million people are employed in the highway transportation industries . . . 45 per cent of all employed people in the United States use automobiles daily in their work or in traveling to and from their jobs . . . in 1900, the hard-surfaced roads of the U. S., if laid end to end, would not have reached from New York to Boston (*if this were amended to read "hard-surfaced roads in good repair" it might even hold true today*) . . . Husbands usually choose the make of car, but wives choose the color.

In view of these facts, does anyone doubt that more than 5 million new cars will be sold during 1954?

Underwater Operation

Remember when as a lad you used to read fascinating tales of treasure lost at sea and of the wild-cat adventurers who searched the bottom of the ocean to find them? Those were the days when the deep-sea diver basked in the aura of mystery and romance. Today, he is taking his place alongside the carpenter, the welder, the engineer and the machinist as a skilled, highly specialized industrial worker.

Witness the case of the Wheeling Steel Corp.'s recent employment of a deep-sea diver to do a very ordinary job under very unusual circumstances . . . under 17 feet of water, to be specific.

Wheeling Steel recently opened a new continuous strip galvanizing line at their Martins Ferry, O., plant. Due to the fact that the normal river pool stage is about 35 feet below the floor line of the mill, control of water was a major problem during construction.

To insure water tightness in the completed pits, a 4-foot-thick concrete slab was poured and sealed under approximately 17-feet of water by utilizing the skills of a real, honest-to-goodness deep-sea diver.

The pits have proved so water-tight that the sump pump operates less than once per week. "Another industrial job well done by your deep-sea diver in action."

A New Alloy

We've seen all sorts of "new baby" announcements but none quite like Len Taussig, Magnaflux Corp. metallurgist, put together to tell the world about Lisa.

Presenting a New Alloy
Name: LISA JILL

Major Constituents: Shirley Taussig and Leonard Taussig
Density: 6 lb, ½ oz

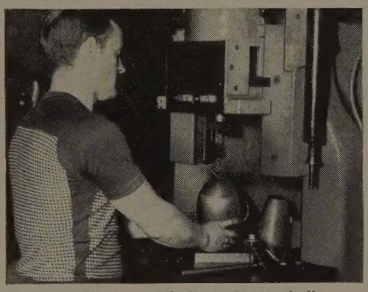
The new alloy was presented to the world on Jan. 29, 1954, with the co-operation of the Edgewater Hospital laboratories. The alloy is definitely of the precious type and was cast in a one-of-a-kind mold. The alloy is quite malleable and soft, has a high lustre and exhibits a tinge of dark fibers on its upper section. *The labor cost was amortized over a nine month period and future forseeable assets are definitely of the liquid type.*

Shrdlu

(Metalworking Outlook—Page 43)

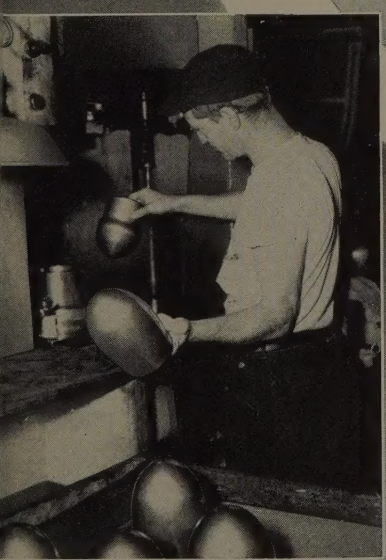
Here's a deep-drawing steel that stays in the...

Spotlight



Punching cord hole in lamp shell

Ventilation holes are punched into shell



The last of six draws that completely forms deep lamp shell reflector.

Mass production of an extra deep draw was the problem that faced a large eastern metal fabricating concern, when asked to make the shells for the popular new spotlight type lamp.

The lamp producer came to this fabricator because past experience proved his ability to successfully tackle the tough jobs. In turn, the fabricator specified **Sharon Deep Draw Quality Steel,** and this combination quickly erased the problem.

Beginning with 11½-inch diameter blanks, the lamp shells are formed in six draws. The finished shell is seven inches deep with an opening of five inches.

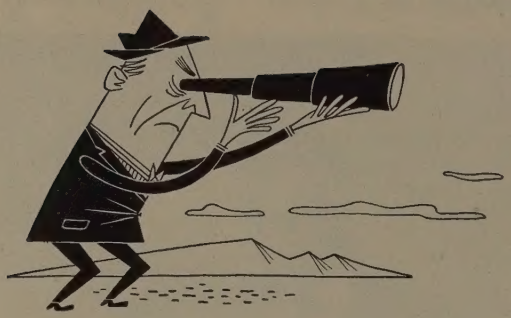
If drawing is part of your business and you are concerned with costs, you should know about these **Sharon Deep Draw Quality Steels.** To find out simply contact the Sharon office nearest you. They're listed below for your convenience.

SHARONSTEEL

SHARON STEEL CORPORATION

Sharon, Pennsylvania

DISTRICT SALES OFFICES: Chicago, Cincinnati, Cleveland, Dayton, Detroit, Indianapolis, Los Angeles, Milwaukee, New York, Philadelphia, Rochester, San Francisco, Seattle, Montreal, Que., Toronto, Ont.



You needn't look far

for Honeywell instrument service

Because instruments have become such vital links in the production chain, Honeywell has developed a service organization that is the largest of its kind in the world. No matter where you may be, there's a Honeywell service man near you . . . in more than 110 service centers spotted strategically throughout the United States and Canada.

A wire or phone call to the nearest of these centers will bring help in a hurry . . . often in a matter of hours. And the service you get is expert. Honeywell men are trained, by factory schooling and field experience, in the most modern methods of keeping good instruments in peak condition.

Frequent check-ups *prevent* emergencies . . . protect your instrument investment. The economical way to do this is a Periodic Service Contract, which brings a Honeywell man to your plant at regular intervals to inspect, clean and adjust your instruments and controls. Your local Honeywell office will be glad to give you full details, and to arrange a custom-fitted contract for your requirements.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

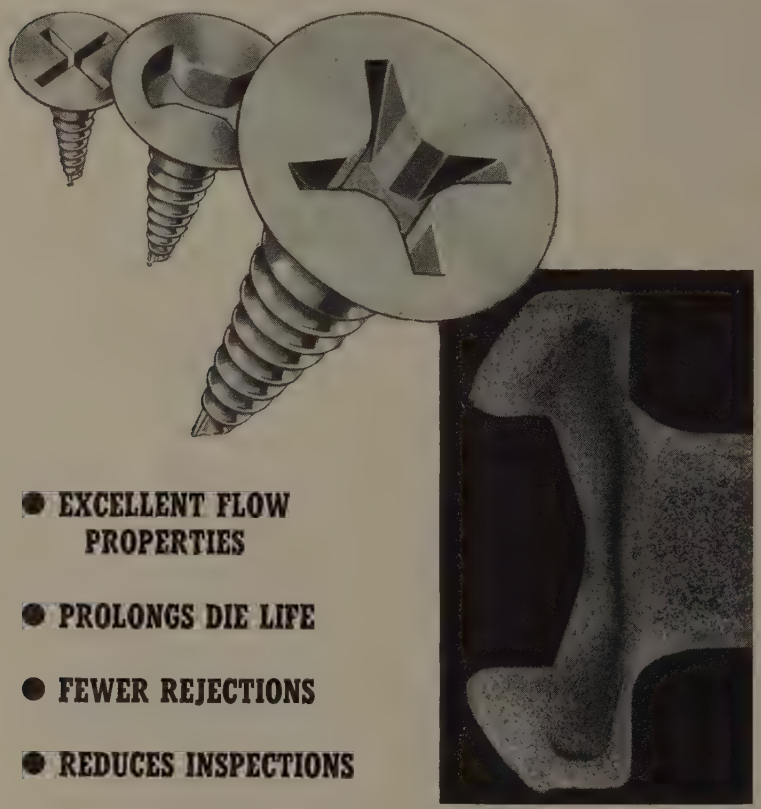
MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Helping you
reach
production goals
STERLING
BOLT COMPANY
General Offices
Manufacturing Plants
Chicago • Milwaukee • St. Louis

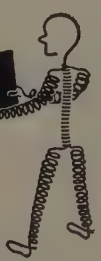
KEYSTONE "SPECIAL PROCESSED" COLD HEADING WIRE



- EXCELLENT FLOW PROPERTIES
- PROLONGS DIE LIFE
- FEWER REJECTIONS
- REDUCES INSPECTIONS

The excellent grain flow properties of this superior cold heading wire assures the desired upsetting and die forming qualities you need for greater efficiency in the production of Phillips head, clutch head and cross-recessed head screws.

The structural soundness and uniformity of Keystone "Special Processed" Cold Heading Wire is attained by careful selection of raw materials, our own exclusive drawing and heat treating process, rigid quality controls and inspections. Compare the performance of Keystone "Special Processed" Cold Heading Wire next time you have a difficult cold heading problem to solve.

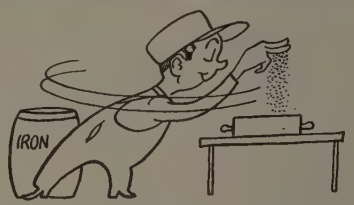


INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS TO THE EDITORS

Industry and Metal Powders



Our engineering laboratory would very much like to obtain two tear sheets of your article "Metal Powders Ease Production Headaches."

M. Griffith
Research & Development Laboratory
International Business Machines Corp.
San Jose, Calif.

I read your article "Metal Powders Ease Production Headaches" (Jan. 25, p. 88). I have been very much interested in the progress of metal powders for the past few years and feel there is an immense future and application for them.

I have been unable to obtain sufficient information in regard to powders, processing and possibilities of forming different parts. Your article tended to stimulate and whet my appetite.

Would you please give me the address of the F. J. Stokes Machine Co., makers of powder metal presses. I would like to write them in reference to types and sizes available.

Walter Ruefli
superintendent
Gleason Tool Corp.
Torrington, Conn.

● *The address is: F. J. Stokes Machine Co., 5930 Tabor Rd., Olney, Philadelphia 20.—ED.*

Series Offers Help

Your series of interesting articles, STEEL's Program for Management for 1953, has been very illuminating and very productive in generating new thoughts.

The more I thought of that series, the more I would like to take portions of the program and use them in our own organization. Therefore, will you please send me the complete set of ten articles in the 1953 series.

Philip Saks
vice president
Accurate Parts Mfg. Co.
Harvey Plant
Harvey, Ill.

● *Sent.—ED.*

Talk About Fire Protection

Several people in our company have noticed your story "The First 2 Minutes Count the Most" (Feb. 8, p. 112) and called it to my attention. Two distributors calling in on other subjects mentioned it in telephone conversations. It was a pretty thorough-going story.

Stuart Grant
advertising & sales promotion manager
Walter Kidde & Co. Inc.
Belleville, N. J.

Please turn to p. 12

20% STEEL SAVINGS

WITH

AJAX-NORTHRUP

INDUCTION HEAT

FOR

Forgings

Ajax-Northrup induction heat works so fast there's no time for scale to form. This not only saves steel, but gives longer die life, closer tolerances, a smoother finish and fewer rejects. This all adds up to steel saving—as much as 20% for some work.

Ajax-Northrup heaters are available to heat all or any part of a billet, with precise temperature and gradient control, and with any desired type of automatic timing and handling devices. They fit right into your production line, take up little floor space, are clean, quiet, and easy to live with.

Our 37 years of induction heating experience can help you produce better forgings, cut costs, and save steel. Write us today.

152

Since 1916

AJAX ELECTROTHERMIC CORPORATION
Ajax Park, Trenton 5, New Jersey

Associated Companies
AJAX ELECTROMETALLURGICAL CORP.
AJAX ELECTRIC FURNACE CORPORATION
AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

AJAX NORTHRUP

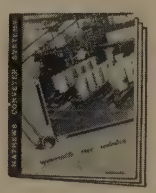
INDUCTION HEATING AND MELTING

OVERHEAD TROLLEY CONVEYERS

one of the many types of high-quality power and gravity conveyers in the MATHEWS Line

Overhead Trolleys are among the most frequently applied types of power conveyers. They are used to serve processing machines, move material from one area to another, take components through painting, drying and enameling operations, and are, in fact, an extremely versatile type of equipment. Trolley Conveyers can be lowered, through the use of transverse bends, to working areas so that parts may be placed or removed from hooks or trays. They are used for storage conveyers, holding materials until needed and saving valuable floor space for production machines.

• Write for catalog HB53 for complete details of Trolley Conveyers and for other types of Power Conveyers and Special Conveying Machinery, or for Catalog No. 853, featuring numerous installations that might help you with your conveying problems. Both catalogs are yours for the asking.



MATHEWS CONVEYERS

GENERAL OFFICES . . . *Mathews Conveyer Company*
ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIVISION . *Mathews Conveyer Company West Coast*
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . *Mathews Conveyer Company, Ltd.*
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

LETTERS

Concluded from p. 10

We would appreciate receiving eight tear sheets of your article "The First 2 Minutes Count the Most." We would like to use them in our training program for our foremen.

Carlton J. Conrad
purchasing agent
E. H. Titchener & Co.
Binghamton, N. Y.

Read with interest your article "The First 2 Minutes Count the Most." It's a wonderful job. In my opinion, it's one of the best articles on the subject of engineered fire protection that I have had the pleasure to read. You are to be congratulated for having such a fine understanding of your subject to have been able to compile such an interesting article.

Robert A. Joyce
president
Robert A. Joyce Co.
Youngstown

Know Your Automobiles

In the "Mirrors of Motordom" column for Feb. 8 we found the interesting page titled "1954 4-Door Sedans—What You Get for Your Money" (p. 82). Several of our people are very anxious to have this for their reference and we are writing for three tear sheets of it.

L. P. Helm
Raub Supply Co.
Lancaster, Pa.

We would appreciate receiving a copy of the page "1954 4-Door Sedans—What You Get for Your Money."

LeRoy A. Reigel
purchasing agent
Hahn Motors Inc.
Hamburg, Pa.

Handbook Almost Invaluable

We have found STEEL of great interest and your Specifications Handbook almost invaluable.

A. H. McKenna
superintendent of stores
Fairbanks, Morse & Co.
Beloit, Wis.

There is no doubt that STEEL is an excellant magazine, but better yet is the "bonus" Specifications Handbook. As I am in the middle of a Navy job, I wonder how I got along without the Specifications Handbook before.

Gordon M. Coupe
supervisor
Carrier Corp.
Syracuse, N. Y.

Accent on Safety

I would sincerely appreciate your permission to reproduce your article "What About Your Safety Program?" (Nov. 30, p. 101). I want to be sure that our foremen have an opportunity to read this article, and feel the best way is to send each one a separate copy.

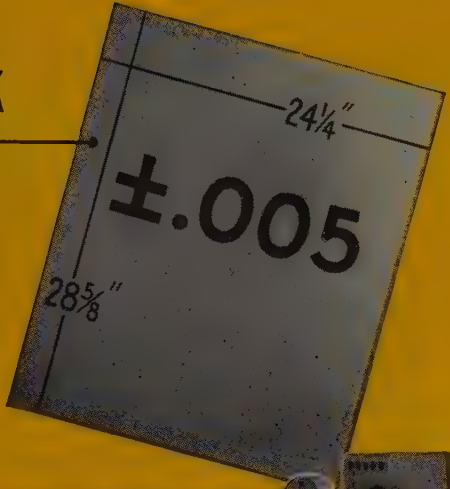
Donald F. Halper
safety director
Mall Tool Co.
Chicago

• *Permission granted.—ED.*

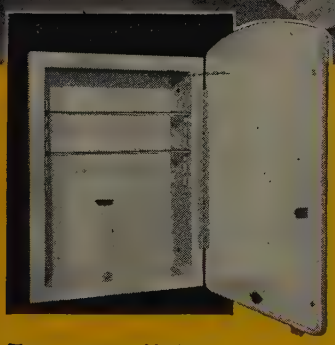
THIS accurate BLANK

saves money

ALL ALONG THE LINE



Photos Courtesy The F. H. Lawson Company



These accurate blanks are held to tolerances of ± .005" on Cincinnati Shears in the shops of The F. H. Lawson Company, manufacturers of medicine cabinets, pails and all sorts of containers.

In lots of 10,000 at 400 an hour these 24½" x 28⅝", 26 gauge blanks are produced with such accuracy that production costs all along the line are low. One and one-half to two million cuts are made before knives need regrinding . . . another important factor in the low cost. Rejects and reworks are very few. Only accurate blanks bring low cost forming and assembly.

Write for Catalog S-6.

CINCINNATI

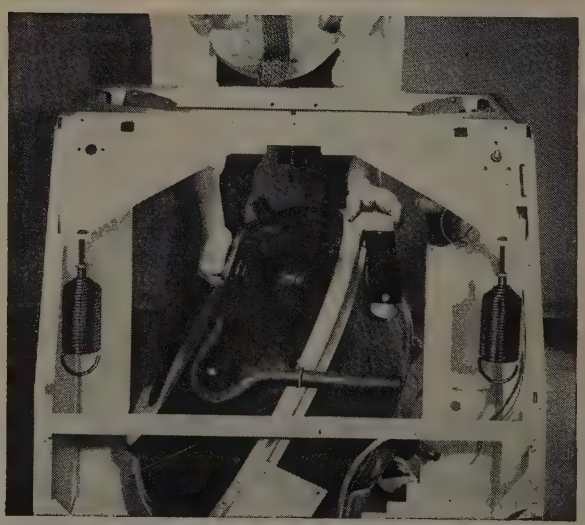
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

Over 1,000,000

OVER A MILLION families wash their clothes in Laundromats. Westinghouse also does a big export business, so these machines have to be trouble-free.

HERE, a man installs the main suspension springs. The springs are periodically tested to meet severe 450 c.p.m./⅝-inch amplitude, vibration tests.



AS UNIT IS INSTALLED in shell, man holds top damper spring. Notice damping blocks on end of flat spring to reduce excess movement.

Laundromats in use, but...

"We've never had a failure with American Quality Springs"

says WESTINGHOUSE ELECTRIC CORPORATION

THE Westinghouse Laundromat has been a household word ever since the first unit rolled off the production line in 1940. Since then, Westinghouse has produced over 1,125,000 Laundromats. Despite many important improvements, the superb spring suspension system has stood the test of time. It's the same today as it was in 1940, because it was designed so well in the first place.

Three different styles of American Quality Springs are used in the Laundromat. The *coil* springs support the entire weight of the machine within its shell. The *flat* steel springs contain friction dampers that limit excessive movement caused by an unbalanced load during the spin-dry cycle.

Failure of a coil spring could damage the entire machine. At the least, it would mean an expensive service call. But, because of the efficient design, and the completely reliable American Quality Springs, *no spring has ever failed in a Westinghouse Laundromat.*

If service like this makes sense to you, get in touch with your nearest American Steel & Wire representative. We make all kinds of springs, any steel, any finish. And you'll get the same kind of quality that Westinghouse gets.

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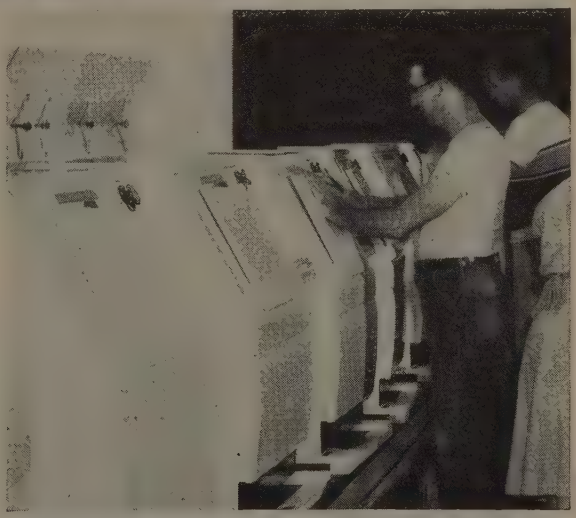
U·S·S American Quality Springs

UNITED STATES STEEL

BOTTOM DAMPER springs are installed. Because of the entire engineered suspension, Laundromat was one of the first washers that didn't have to be bolted to floor.



WESTINGHOUSE LAYS DOWN rigid specifications for their American Quality Springs, proving their motto, "Quality must be *built* into a product."

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PRECISION BENDING
with DI-ACRO* Hydra-Power Bender!

Simple and complex bends are readily formed and duplicated in many ductile materials with hydraulically operated Di-Acro Benders. The Bender can be delivered completely tooled for bending moulding, extrusions and other solid materials. Tooling can be made in your own plant if you prefer.

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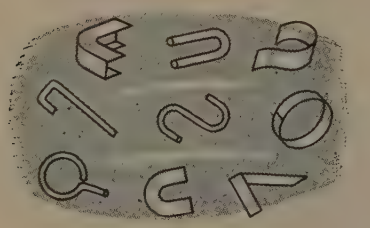

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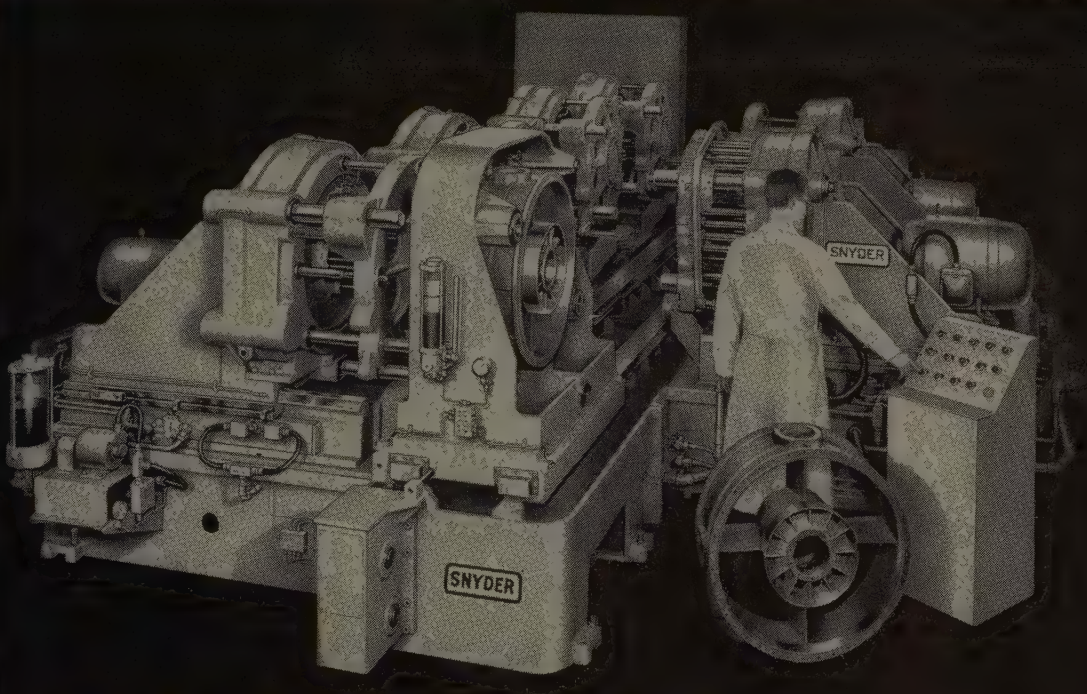

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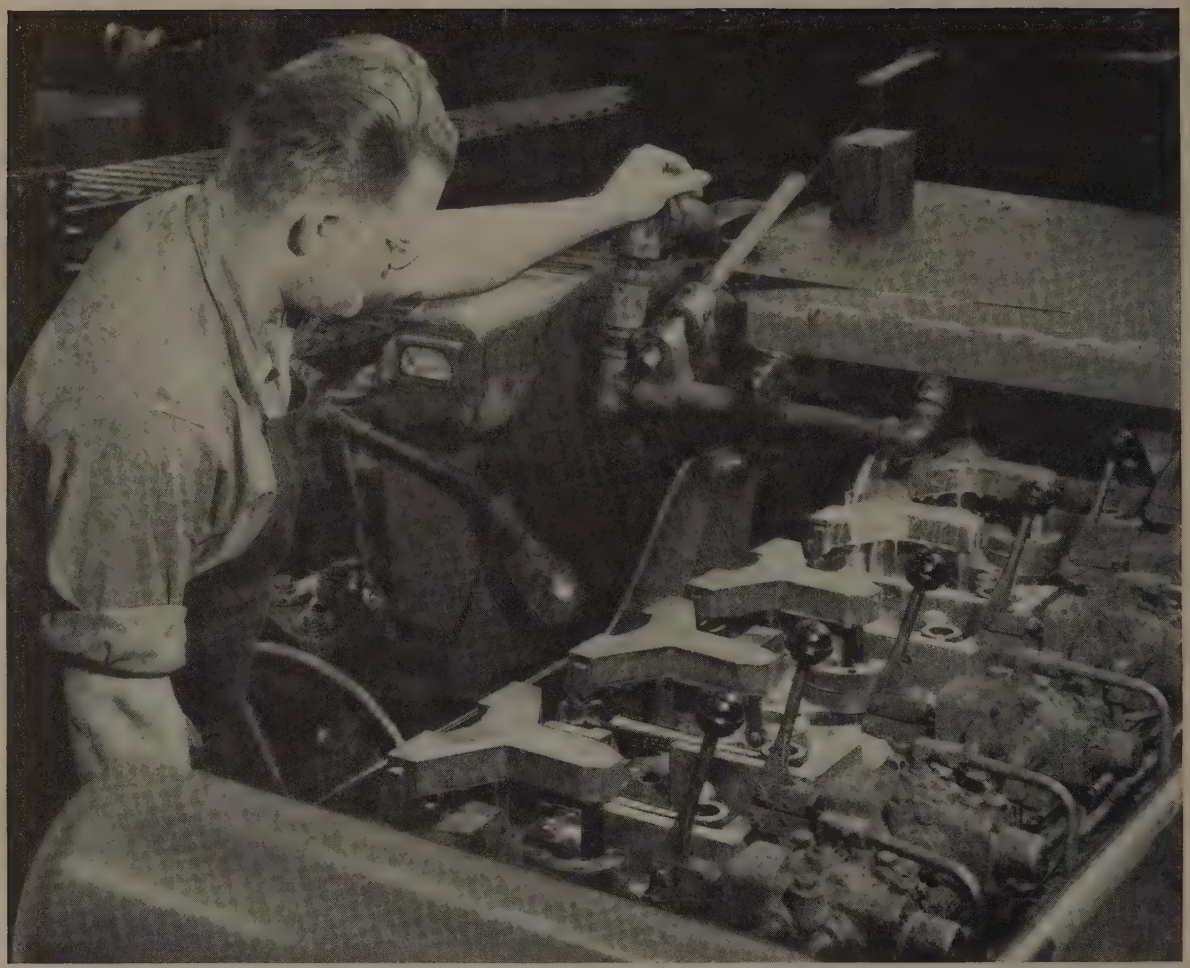
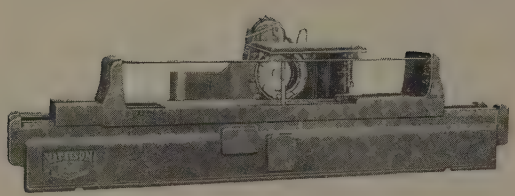


Grinding matching surfaces of connecting rods on Mattison 4000 Face Grinder at Caterpillar Tractor Co.



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Mattison Face Grinders will handle a wide range of work and are profitably used in virtually all industries — metal working, railroad shops, paper and pulp mills, terra cotta and rubber plants, steel mills and foundries. Ask us for free copy of bulletin 846-2RM for further information on our complete line of Face Grinders.

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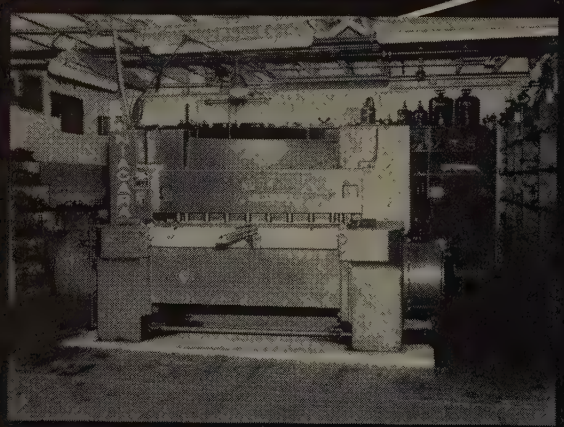

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CALENDAR
OF MEETINGS

March 2-4, Society of Automotive Engineers Inc.: National passenger car, body and materials meeting, Hotel Statler, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 3, Steel Kitchen Cabinet Manufacturers Association: Spring meeting, New York. Association address: Engineers Bldg., Cleveland 14. Executive secretary: Arthur J. Tuscany Jr.

March 3-4, American Machine Tool Distributors Association: Spring meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

March 4-5, American Society for Metals: Midwinter meeting, Hotel Statler, Boston. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

March 8-12, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 9-12, American Management Association: General management conference, Fairmont hotel, San Francisco. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

March 10-12, Society of the Plastics Industry Inc.: Pacific coast section conference, Hotel del Coronado, Coronado, Calif. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 10-12, American Society of Mechanical Engineers: International meeting, Hotel Del Prado, Mexico City, D. F. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

March 15-17, National Association of Waste Material Dealers Inc.: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

March 15-19, National Association of Corrosion Engineers: Annual conference and exhibit, Municipal Auditorium, Kansas City, Mo. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

March 15-19, National Association of Manufacturers: Institute on Industrial Relations, Hollywood Beach hotel, Hollywood, Fla. Association address: 14 W. 49th St., New York 20. Director, Employee Relations Division: Sybil S. Patterson.

March 16-17, Engineering Institute on Industrial Ventilation: University of Wisconsin, Madison 6, Wis. Information: Professor Ray C. Tegtmeyer, Stadium Offices, University of Wisconsin, Madison 6, Wis.

March 16-17, Steel Founders' Society of America: Annual meeting, Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Executive vice president: F. Kermit Donaldson.

March 17-19, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: O. B. Werntz.

March 18-19, American Management Association: Special conference on employee group benefits, Hotel Roosevelt, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

March 19-20, Machinery & Allied Products Institute: Fourth session, seventh conference on capital goods economics, Greenbrier Hotel, White Sulphur Springs, W. Va. Information: Secretary, Charles W. Stewart, 1200 18th St. NW, Washington 6.

March 21-23, Controllers Institute of America: Eastern spring conference, Sheraton Park Hotel, Washington. Institute address: 1 E. 42nd St., New York 17. Director of public relations: G. K. Dahl.

March 24-26, American Power Conference: Annual meeting, Hotel Sherman, Chicago. Information: Edwin R. Whitehead, conference secretary, Illinois Institute of Technology, Technology Center, Chicago 16.

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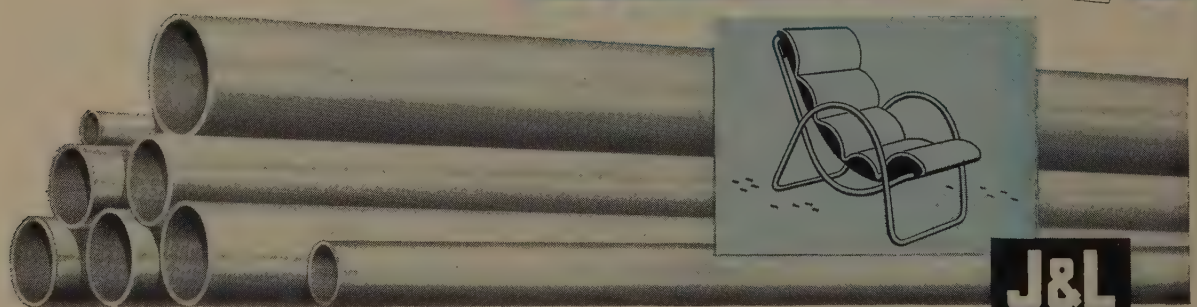

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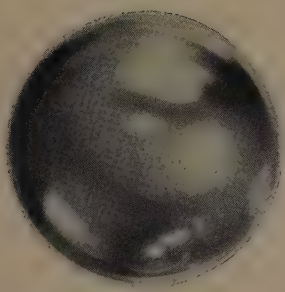

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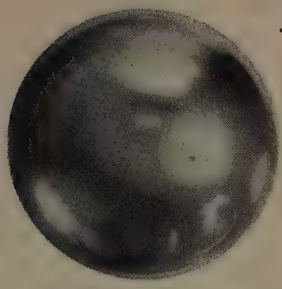

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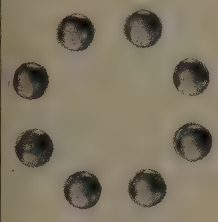

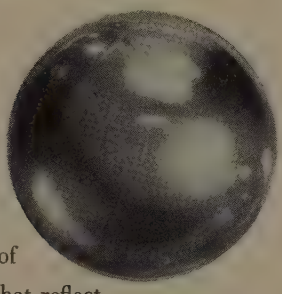

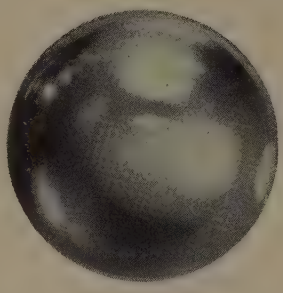

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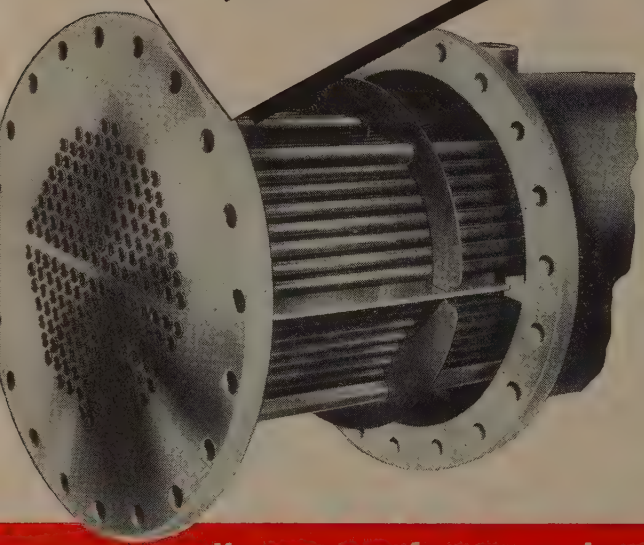

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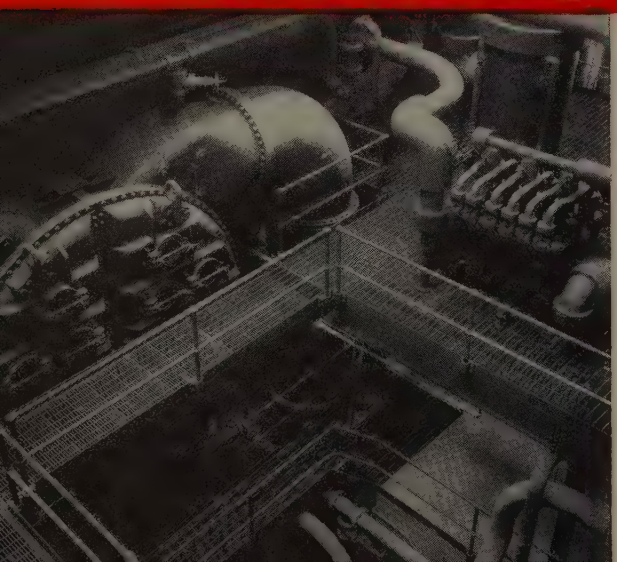
Here are a few examples of the many alloy steels developed t



LOW NICKEL ALLOYS (3½% and 5% nickel). These alloy steels are widel used where high impact resistance at sub-zero temperatures is desire Additionally, they are used to combat general corrosion by neutral sa solutions such as sodium and potassium nitrate or sulphate. They ar also advantageous in minimizing caustic embrittlement—a special typ of corrosion occurring when stressed carbon steel is in contact with h alkaline solutions. Soda and Kraft paper mills find these nickel steels gi increased performance over plain carbon steel in black liquor evaporator

MEDIUM CHROMIUM ALLOYS (5% chromium ½% molybdenum to 9 chromium 1% molybdenum—some with high silicon content). The alloys have oxidation resistance and strength characteristics at hig temperatures similar to the low chromium alloys. Corrosion resistanc particularly to sulphur compounds such as SO_2 and H_2S, is general appreciably better than that of the lower chromium alloys, hence the find application where the latter group does not afford sufficient increa in service life.

eamless Alloy Steel Tubes

nbat specific corrosion problems:

CHROMIUM ALLOYS (1¼% chromium ½% molybdenum to 3% chromium nolybdenum—some with high silicon content). Principal applications are ervice conditions requiring oxidation and corrosion resistance, as well as nable strength, at elevated temperatures. These alloys are used to resist deterioration in service involving hot corrosive gases in many industrial cations.

STAINLESS STEELS (18-8 and modifications with titanium, columbium or bdenum). These alloys resist oxidation at temperatures up to 1500°F; they exhibit excellent strength combined with high ductility and impact resis-, together with maximum corrosion resistance, at all temperatures from the t obtainable up to above 1500°F. They find wide application under the severe service conditions in the heavy chemical industries, including the d fields of petroleum refining and paper making. They are extensively used od processing, dairy and beverage industries, and drug preparation to avoid and color contamination. Their general corrosion resistance makes them l in the field of plastics preparation, fabric dyeing, and numerous others.

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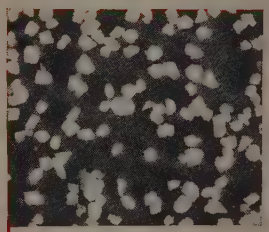

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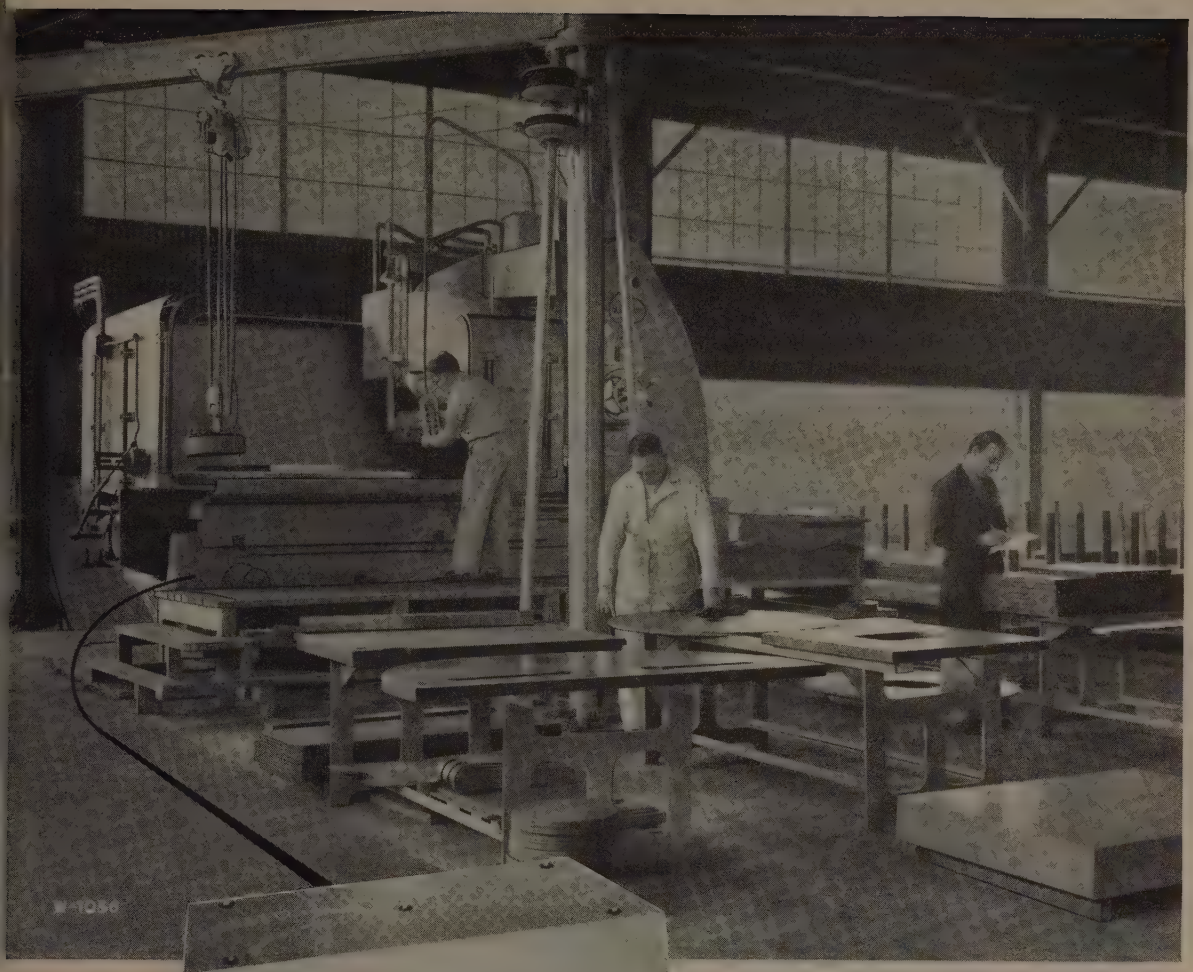

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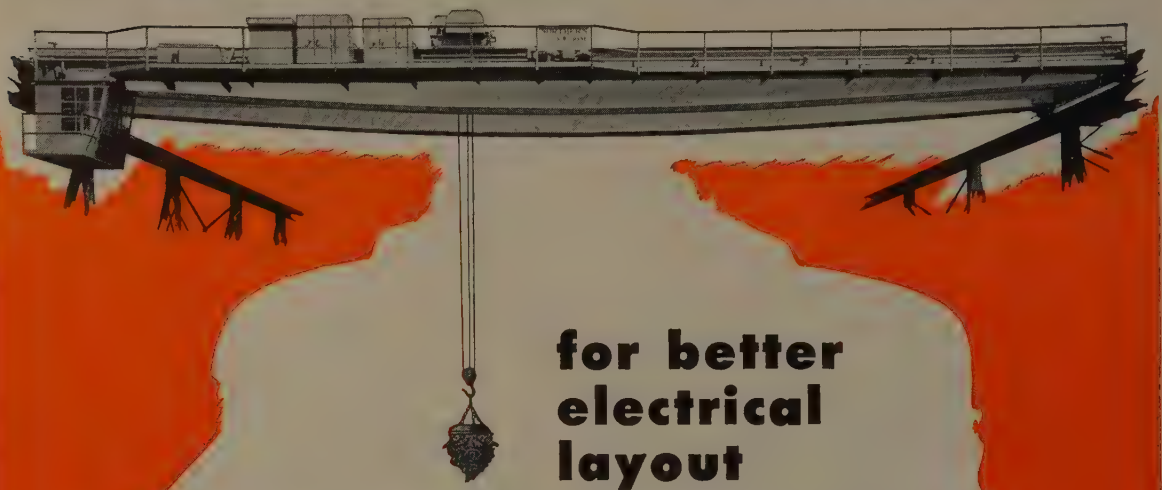

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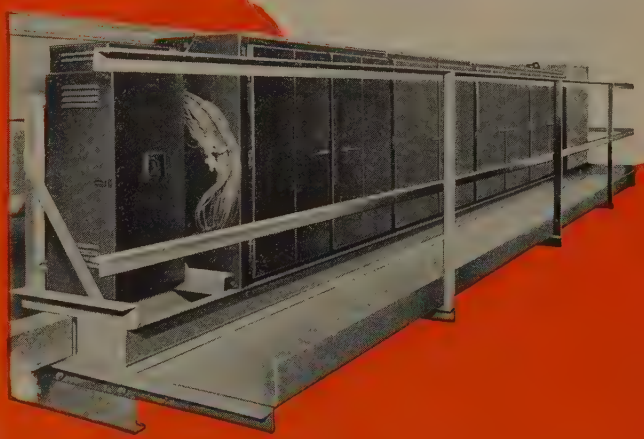

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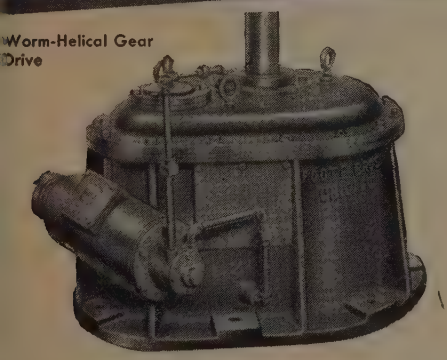

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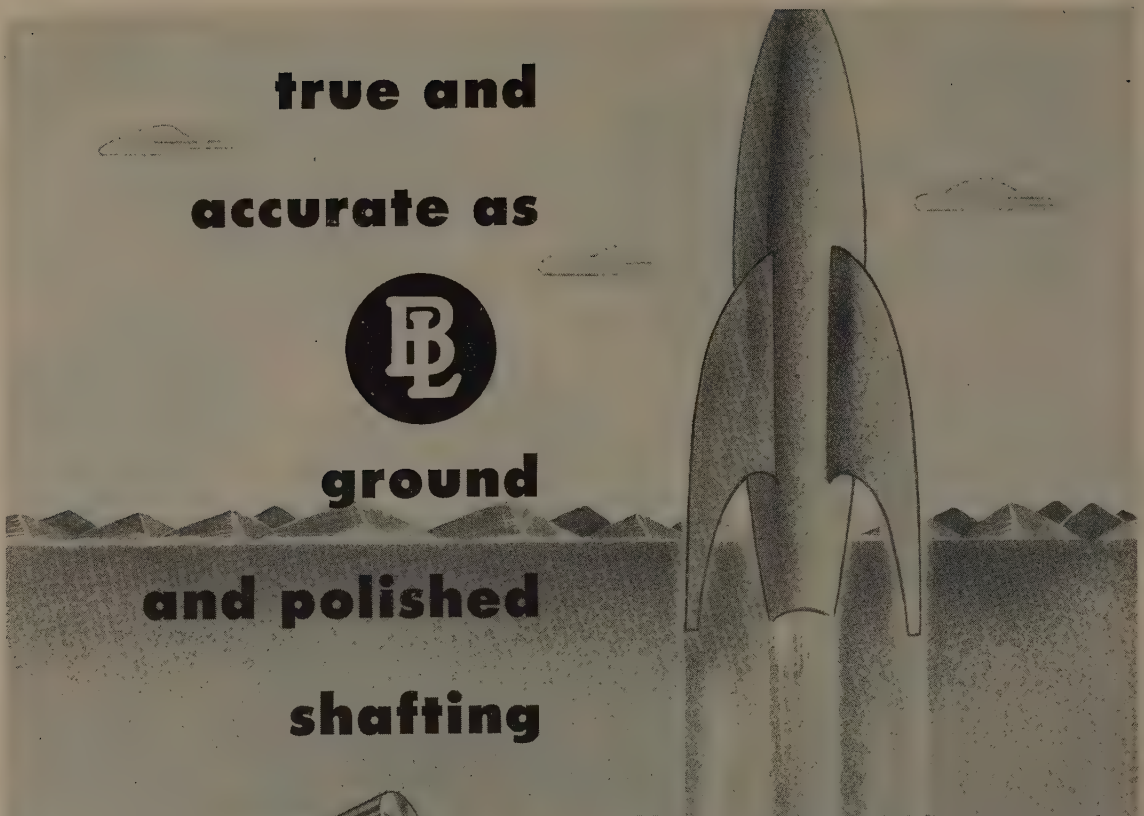

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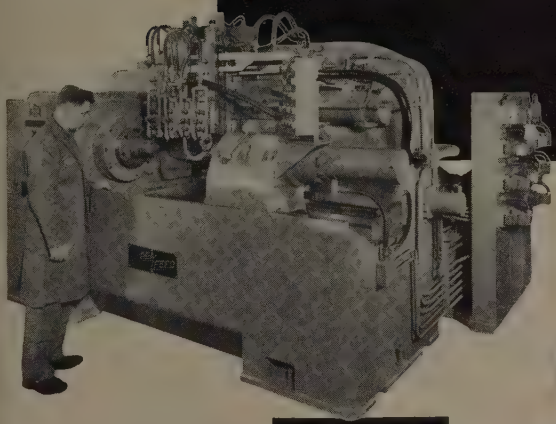

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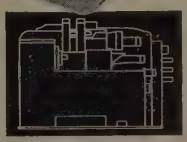

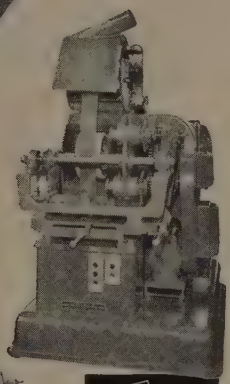

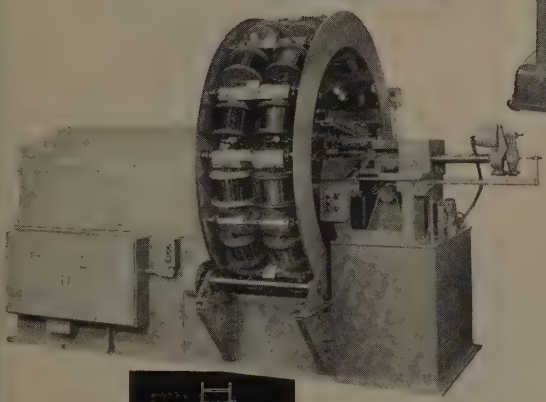

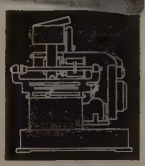

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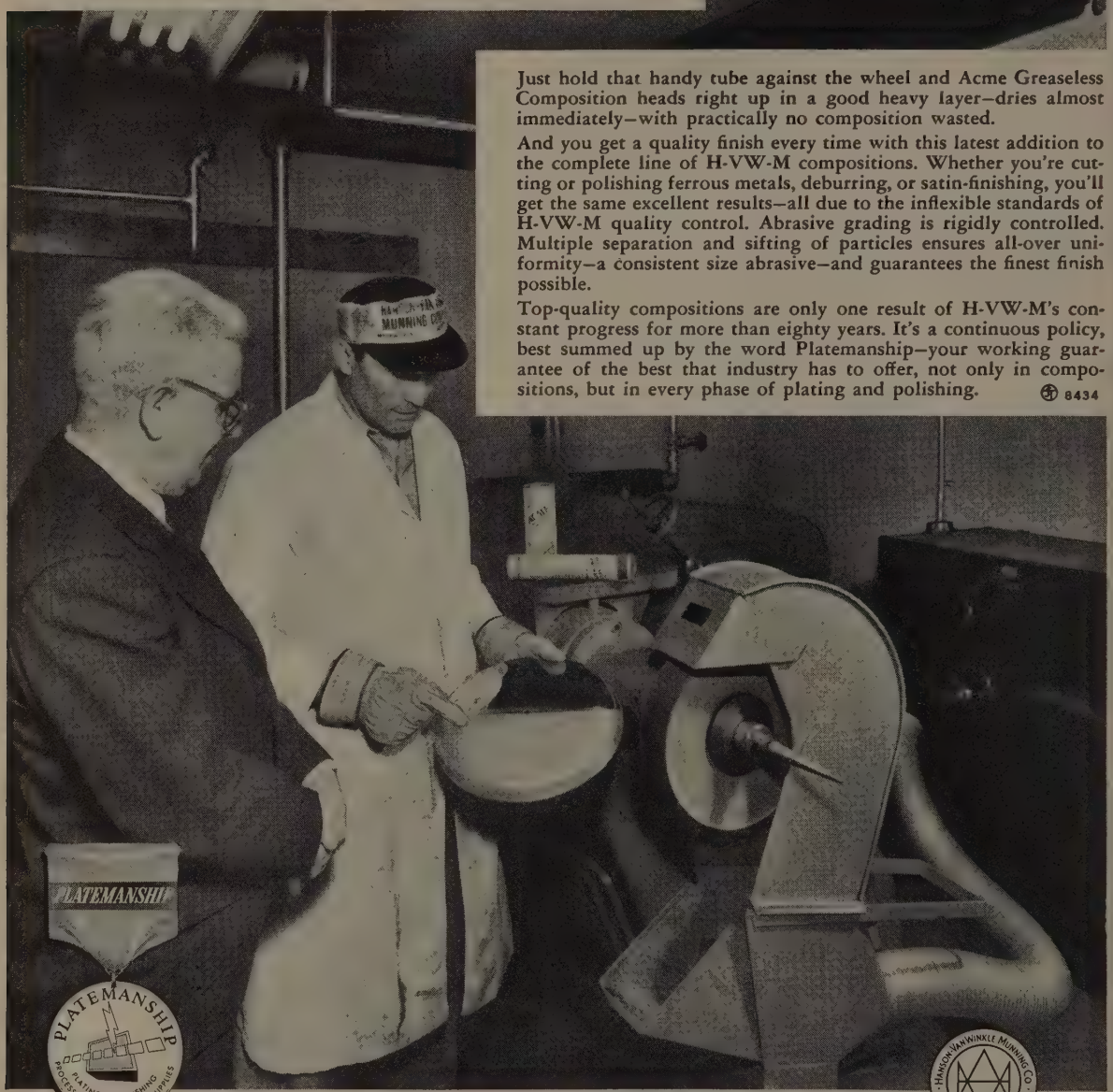

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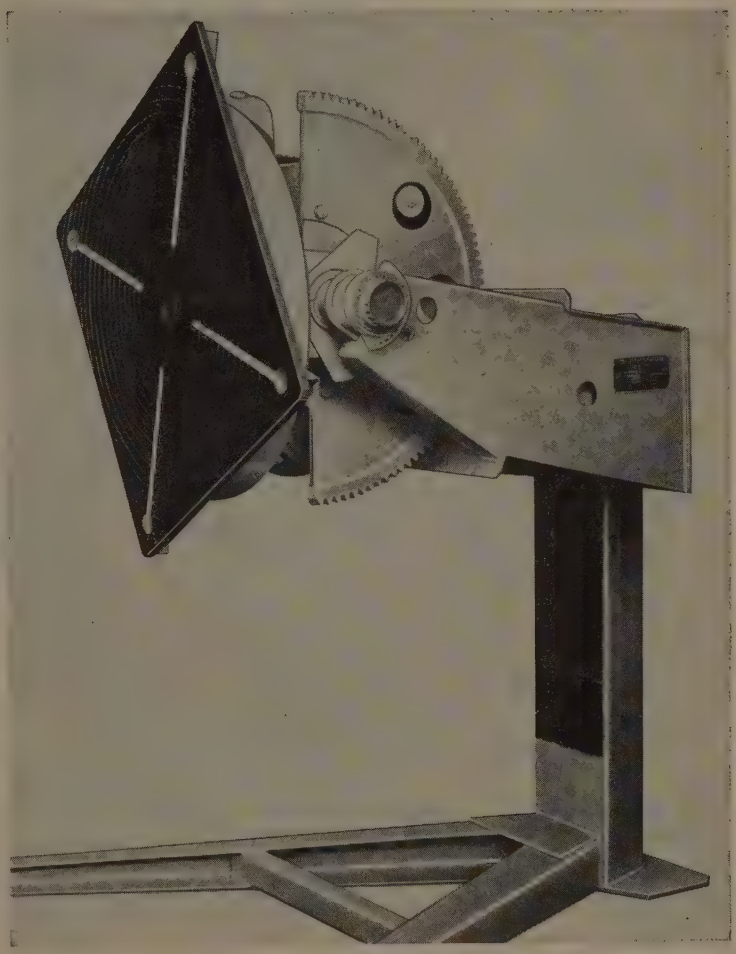

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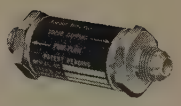

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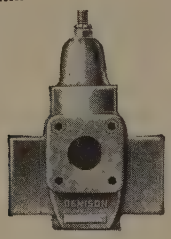

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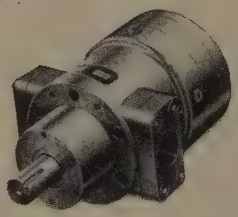

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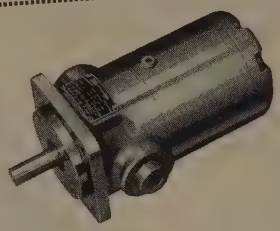

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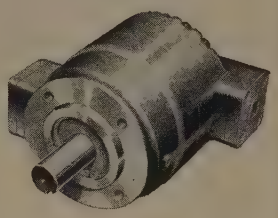
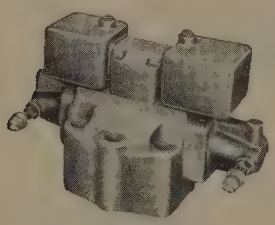
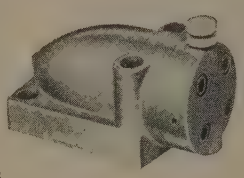
1500 to 3000 rpm
Catalogs FM-1, FM-2, FM-3-A



Dual-Purpose, Vane-Type PUMP/MOTOR
Ready for either pump or motor use without change
Shaft rotation in either direction
Four Sizes, 11 Models
Pumping Capacities: 3 to 82 gpm.
Motor Torque: 13 to 257 inch-pounds per 100 psi. Pressures to 2000 psi.
Bulletin P-5

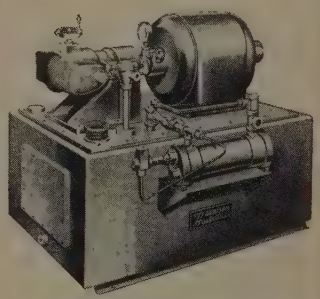


DIRECTIONAL CONTROLS
Manual, Mechanical, Electric or Pilot Control. ¼" to 2" Sizes
For Pressures to 5000 psi
Catalog VD-3



PRESSURE REDUCING VALVES
¾" to 1½" Sizes
20 gpm to 65 gpm Capacities
For Pressures to 5000 psi
Catalog VPR-1

Multi-Range FLOW CONTROLS
Full-Scale Regulation—Adjustable for Varying Input
¼" to ¾" Sizes
For Pressures to 3000 psi
Catalogs VFC-1, VFC-2



PUMPING UNITS
Constant and Variable Volume
46 Models—2 to 35 gpm Capacities
For Pressures to 5000 psi
Bulletins PU-3-A, PU-4 and PU-5

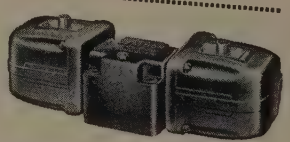
PROVED IN USE

under industry's toughest operating conditions

Denison HydrOILic Pumps, Motors and Controls are noted for their combination of high efficiency and rugged dependability.

In addition to fine performance under continuous, heavy-duty use, Denison HydrOILic Equipment offers space-saving design that simplifies circuit layout, makes installation easier, and minimizes maintenance problems.

Because so many users verify the extra value built into Denison Pumps, Motors and Controls, we continue the challenge made so often before—*let comparison prove to you* why they are first choice for so many needs of every type. Write today for full details on Denison HydrOILic Equipment to meet your requirements.



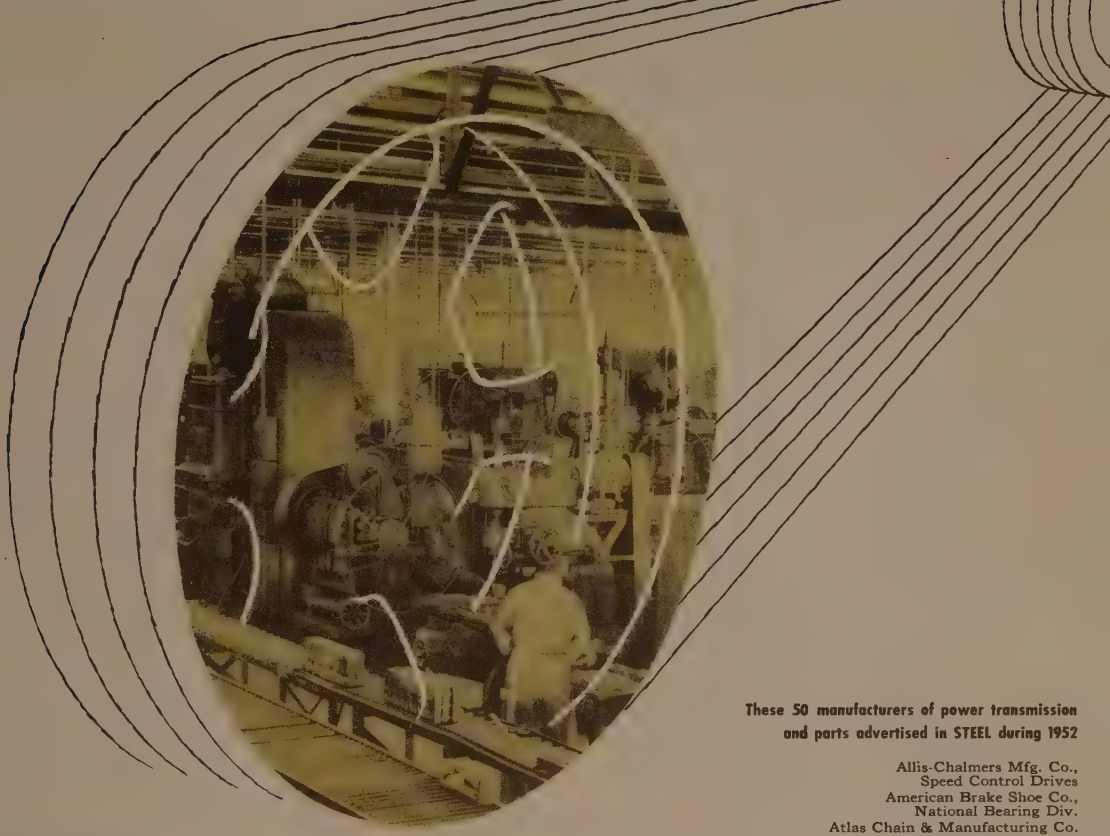
Pilot-Operated, Solenoid-Controlled DIRECTIONAL VALVES
Eliminate Spool-Sticking
¾" to 1½" Sizes, For Pressures to 5000 psi
Catalogs VD-1-1 to VD-4-2

Be Sure To See
DENISON BOOTH #1400
at ASTE SHOW

DENISON HydrOILics
PUMPS | MOTORS | CONTROLS | PRESSES

"The Finest Money Can Buy!"

The DENISON Engineering Company, 1163 Dublin Road, Columbus 16, Ohio



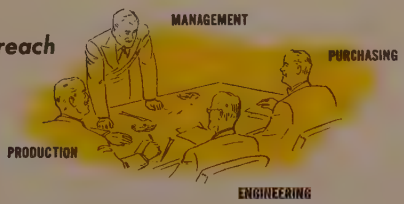
If your product belongs in metalworking...

your advertising belongs in....

Power transmission advertisers have a vital stake in STEEL's market—because it's the biggest of all industrial markets. Another important reason why so many power transmission advertisers use STEEL is because it is read by all 4 members of the buying group—management, production, engineering and purchasing executives —the key men who have a voice in the selection of power transmission equipment and supplies for the 111 billion dollar metalworking industry.

STEEL • Penton Building • Cleveland 13, Ohio

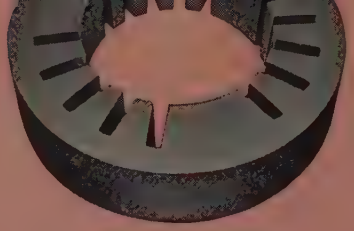
You advertise in STEEL to reach all four buying influences



These 50 manufacturers of power transmission and parts advertised in STEEL during 1952

Allis-Chalmers Mfg. Co., Speed Control Drives
American Brake Shoe Co., National Bearing Div.
Atlas Chain & Manufacturing Co.
Morse Chain Co., Div. Borg-Warner Corp.
Boston Woven Hose & Rubber Co., V-Belts
Brad Foote Gear Works, Inc.
Pittsburgh Gear Company, Sub. Brad Foote Gear Works
Bunting Brass & Bronze Co.
A. W. Cadman Mfg. Co.
Chain Belt Co., Baldwin-Duckworth Div.
Dodge Manufacturing Corp., Div. Chicago Thrift Etching Corp.
The Cleveland Worm & Gear Co.
Farrel-Birmingham Co., The Sub. Consolidated Machine Tool
Dayton Rubber Co.
Dings Brakes, Inc., Sub. of Dings Magnetic Separator Co.
Excelsior Leather Washer Mfg. Co.
The Fafnir Bearing Co.
Fairbanks-Morse & Co.
Fairfield Manufacturing Co.
Federal-Mogul Corporation
Foote Bros. Gear & Machine Corp.
The Garlock Packing Co.
Gates Rubber Co.
General Electric Co., Adjustable Speed Drives
Hyatt Bearings Div., General Motors Corp.
New Departure Div., General Motors Corp.
B. F. Goodrich Co., The Industrial & General Products Div.
The Hansen Mfg. Co.
Hoover Ball & Bearing Co.
The Horsburgh & Scott Co.
Illinois Gear & Machine Co.
Indiana Gear Works
D. O. James Gear Mfg. Co.
Johnson Bronze Co.
Manheim Manufacturing & Belting Co.
Michigan Tool Co., Cone-Drive Gears Div.
Nice Ball Bearing Co.
New York Belting & Packing Co.
Philadelphia Gear Works, Inc.
Roller Bearing Company of America
Rollway Bearing Co., Inc.
SKF Industries, Inc.
The Simonds Gear & Manufacturing Co.
The Timken Roller Bearing Co.
Torcon Corporation
The Torrington Co.
Union Chain & Manufacturing Co., The
Vinco Corporation
Winsmith, Inc.
Wisconsin Motor Co.

Diesel locomotive part
6" thick, 25" in diameter



Crank shaft blank
1¾" x 8" x 16⅛"

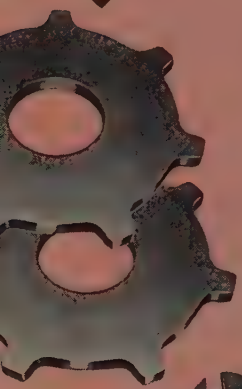
Spider for blower
⅜" thick x 10" x 11½"

Accurately

Flame-Cut Steel

delivered quickly

Circular conveyor parts
26¼" in diameter, cut
from 1½" plate



You see on this page a few of the many thousand different flame-cut steel shapes recently shipped from Ryerson plants. In some cases only one or two pieces were produced from a pattern. In other cases—hundreds. But in every case, steel was cut to close tolerance—with almost die-cut uniformity from piece to piece—and delivered quickly.

Have you investigated this money-saving Ryerson service that cuts the cost of producing flat, irregularly-shaped parts? Here the nation's largest steel stocks are at your disposal, including plate steel of every type, up to 10" thick. And here you'll find the steel-service industry's most complete array of flame-cutting equipment, including multiple torch machines that follow the most intricate patterns with an electric eye.

For fast action, send us your sketch or blueprint and we will quote on any quantity.

JOSEPH T. RYERSON & SON, INC. PLANTS: NEW YORK · BOSTON · BUFFALO · PHILADELPHIA · CHARLOTTE, N.C. · CLEVELAND
DETROIT · PITTSBURGH · CINCINNATI · CHICAGO · MILWAUKEE · ST. LOUIS · LOS ANGELES · SAN FRANCISCO · SEATTLE · SPOKANE

RYERSON

Locomotive part cut from 7" plate

Side plate for conveyor
1" thick x 21¼" x 104⅜"

Machine part cut
from 1" plate

WRITE FOR FLAME-CUTTING BULLETIN No. 50

STEEL
March 1, 1954

Metalworking Outlook

Wage Paradox in Autos

Auto industry wages may drop 1 cent an hour this month, even if the cost-of-living index rises. The consumer price index stood at 115.4 when the last quarterly review was made under the General Motors formula, Dec. 1. Most autoworkers received a 2-cent boost. But by mid-December, the index had dropped to 114.9. To keep wages at the present rate, the index would have to reach 115.4 again. To net the workers another penny, it would have to climb to 116.

Not Enough for Roads

The proposed increase of $225 million annually in highway aid contributions of the U. S. is far below minimum requirements. Including matching funds of the states, that would mean a gain of only $450 million for new construction and improvement. That also means that 1954 public investment in all roads will not exceed $4 billion. A total investment of more than $8 billion annually over a decade is necessary to keep the roads up to standard. At least 64 per cent of the 673,000 miles of the federal-aid highway system alone is substandard.

State, Local Spending Soars

Although federal spending this year for all purposes may drop $5 billion, state and local governments will spend some $2.5 billion more than last year. Their cash and security holdings total almost $25 billion, about half of which is committed to trusts, pensions and the like. But much of the remainder is available for works programs—a factor which will figure heavily in White House plans if pump priming is needed.

Aid to Foreign Traders

U. S. foreign traders can expect more federal help. The Commerce department plans round-table and individual sessions to provide more information on licensing, technical problems, transshipments, markets and foreign investments. Being tried now are a series of trade missions to explore the possibilities of expanding international trade. The first ones are in the food field, but metalworking groups may get a chance later.

Quality, Not Quantity

Air Force Secretary Harold E. Talbott says the emphasis henceforth will be on quality rather than quantity for Air Force weapons and planes. Aircraft Industries Association of America reports that the U. S. plans a long-range procurement program that will minimize the costly production peaks and valleys of the past and that will help to bring savings of more than 25 per cent to taxpayers. The World War II aircraft production program cost $27 billion, but the present build-up will reach an estimated $26 billion. The Air Force will have some 21,000 active aircraft by next June and 22,900 in June, 1955.

Needed: Migraine Pill

The handling of government contracts is an "industrial migraine" and industry should take the lead in bringing about reforms. That's the con-

The Technical Outlook—p. 93 The Market Outlook—p. 151

tention of Howard H. Cork, director of government and tax accounting for Westinghouse Electric Corp. He scores industry for "unconcern." He believes serious difficulties in government contractual relations result from arbitrary, inappropriate policies and practices by government policy-making personnel. He wants individual companies, accounting groups and trade associations to fight for more realistic and understandable government policies.

Labrador Ore by August?

Stepped-up construction may bring the first iron ore from the Ungava and Labrador sections of Canada to American furnaces by next August, not in 1955 as originally scheduled. Some $125 million of the $200 million already spent on the development went into construction of the 365-mile railroad between the mines and the St. Lawrence river. Plans are to get production up to 10 million tons a year as quickly as possible. With the St. Lawrence Seaway, 20 million tons a year could be handled.

Trouble in Coal

This year coal operators, not John L. Lewis, may take the initiative in demanding a wage adjustment. Either side may call for a contract reopening after 30 days' notice. The operators, of course, want a wage drop. "Miners make more than $23 in wages and fringe benefits for 6½ hours' work in an 8-hour portal-to-portal shift, compared to an average in all manufacturing of $13.92 for an 8-hour working day," says Joseph P. Moody, president of the Southern Coal Producers Association. "Our operators are selling at an over-all average loss per ton today," he declares. Northern operators are probably in a little better shape, but they are paring prices, too. Pittsburgh Consolidation Coal Co. just cut steam coal 6 per cent to $4 a ton.

Straws in the Wind

General Motors Corp. President Harlow H. Curtice sent a letter to GM's 18,500 car and truck dealers and distributors pointing out that the "cancerous growth of bootlegging of new cars by enfranchised dealers wholesaling these cars to used car dealers and other outlets threatens the very vitals of your business and ours" . . . Nash is introducing a single unit that air conditions completely by heating, cooling and ventilating the car . . . Although the Republicans got Alfred C. Beeson confirmed as a member of the National Labor Relations Board, the victory may be a Pyrrhic one because the Democrats will use the case as speech ammunition next fall . . . Look for the Renegotiation Act to be extended for another year.

This Week in Metalworking

Thus far in 1954 the unions are playing it cozy (p. 51) . . . The U. S. is studying a plan to moth-ball some privately owned defense plants (p. 53) . . . There could be sales opportunities for you in the $3.5 billion do-it-yourself market (p. 54) . . . The electronics industry is headed for at least $5 billion in sales in 1954 (p. 55) . . . Aluminum wire uses soar (p. 62) . . . A Connecticut company is making a big thing of little shipments of steel (p. 63).

HERESITE

REG. U. S. PAT. OFFICE

LININGS FOR TANK CARS AND TRAILER TANKS

RESISTANCE—Heresite linings effectively prevent product contamination of such items as Sulphuric Acid, Rubber Latex, Formaldehyde, Battery Acid, Lactic Acid, Acetic Acid, Fruit Juices and Wine. These products can be delivered fresh and full strength, unchanged.

EASE OF CLEANING— Heresite lined tank cars are quickly cleaned by Steaming, Hot Water, or any type of Solvent Wash.

HERECROL

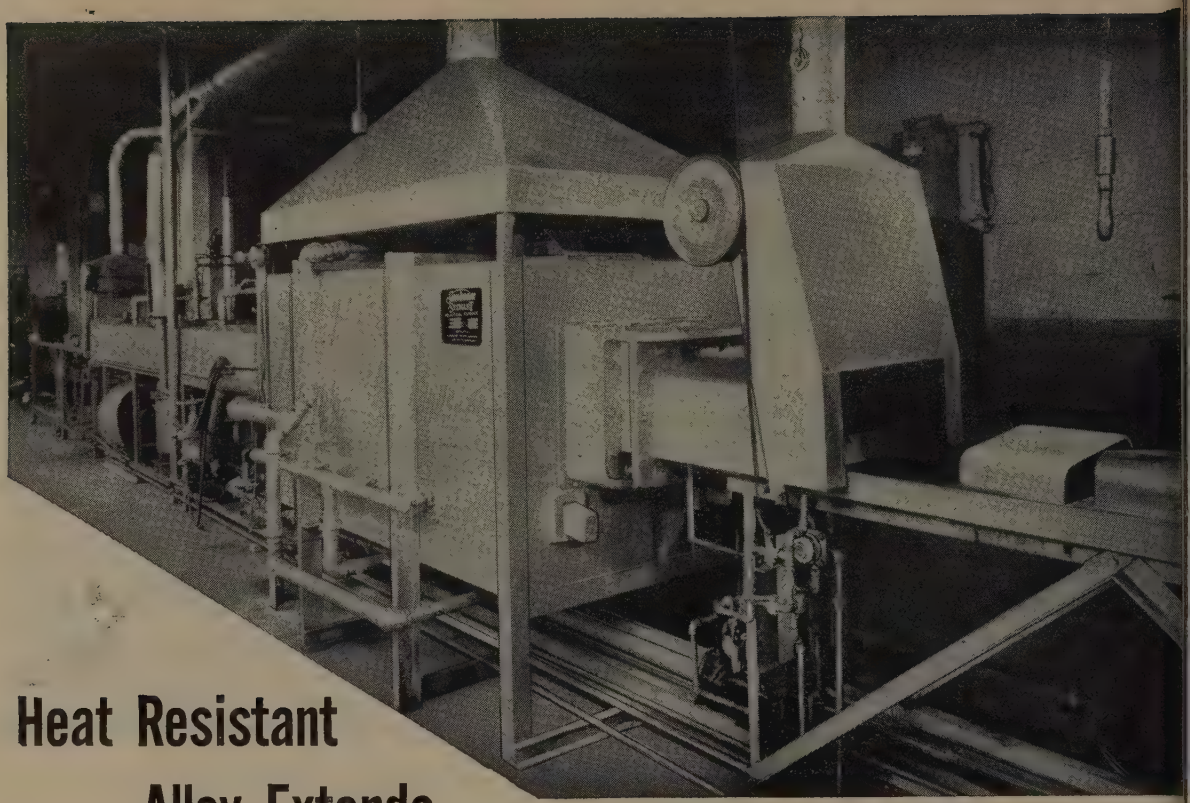
REG. U. S. PAT. OFFICE

SYNTHETIC RUBBER LINING The strongest caustic hydroxide solutions, as well as the halogen acids and other chemicals, may be transported in a HERECROL lined tank car or trailer tank. Our literature will interest you. Write for it today.

HERESITE & CHEMICAL COMPANY

MANITOWOC, WISCONSIN

Branch Office: 327 South LaSalle Street, Chicago, Illinois



Heat Resistant Alloy Extends Equipment Life

Still good after 14 years

The muffle of this annealing furnace has withstood continuous alternate heating and cooling since 1940, except for a shut-down period during the Korean war.

Still in use 14 years after installation, this casting... produced in 35% nickel-18% chromium heat resistant alloy... demonstrates the economy of using nickel alloyed material to resist growth, warping, scaling and other deteriorating effects of heat.

From among the many engineering alloys containing nickel, you can select a material to provide the best set of properties for meeting one or a combination of requirements.

Let us help you find practical solutions to your metal problems. Make use of our counsel and data based on years of specialized experience in the fabrication, treatment, properties and performance of alloys containing nickel. Send us details of your problems for our suggestions.

Original Muffle ...cast in a 35% nickel-18% chromium heat resistant alloy, trade-named "Chromax," and produced at the Harrison, N. J., plant of Driver-Harris Company ... still serves after 14 years in this gas fired, controlled atmosphere, pusher-type furnace manufactured by Sunbeam Corporation, Industrial Furnace Division, Chicago 23, Ill.

Heat Resistant nickel-chromium alloy is also used for the annealing furnace conveyor.

INCO

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

The Will To Spend

At a press conference in February President Eisenhower said that sometime in March we probably would see the usual seasonal pickup in jobs. He promised that if the expected improvement does not materialize, the federal government will act promptly to initiate measures to free money so that the people can step up their purchases of goods and services.

Spokesmen for both political parties, major labor unions, employer groups and the American public agreed immediately that the President's proposal is sound. Partly because of this almost universal approval of the idea of freeing more money for spending if unemployment continues to climb, members of both parties in Congress are renewing their efforts to prepare legislation that would raise the personal income tax exemption, reduce some of the most obnoxious excise taxes, relieve the present double taxation on dividends or ease the tax burden in other ways.

Everybody will agree that the President's promise to render government assistance promptly in case the economic weather worsens is constructive. For one thing, it gives assurance to those who are uncertain about the economic situation. However, it is doubtful whether the administration or the Congress should at this time permit the degree of unemployment to influence tax reform unduly. In fact, they should think twice or thrice before doing anything drastic purely for the sake of "freeing more money for spending."

In 1940 the American people had disposable income after taxes of $75.7 billion. Of this, $49.2 billion was spent for food, clothing and shelter, leaving $26.5 billion which is described as "discretionary spending power." In the third quarter of 1953, the people received income after taxes equal to an annual rate of $252 billion. After paying $114 billion for basic living costs at the 1940 standard of living, they had left for "discretionary spending power" $138 billion. This is by far the largest pool of money available for mass purchasing ever at the command of the American people.

Frankly, our national job is not to "free more money for spending"; it is to stimulate a greater willingness to spend money that already is available.

E. C. Shaner

EDITOR-IN-CHIEF

PERTINENT QUESTION: In connection with today's business outlook, you have heard numerous authorities express their opinions as to whether or not it is possible for the people of a nation to "talk themselves into a depression." It is a good and a timely question. Fortunately you can obtain a very satisfactory answer to it by watching carefully what happens around you in the next week or two.

Tomorrow, one of your old reliable employees

may come to you and say: "I need some good advice. My wife and I find that our old house is too big. Our sons and daughters have married and are raising their own families. Mother and I would like to build a little place where we can enjoy our remaining years without too much housekeeping effort. Financially we can swing it without difficulty. However, we hear talk about a recession. Shall we go ahead and build our house this year or shall we wait until the talk about recession dies down?"

* * *

BARGAIN DAYS OF 1954: Advice given to prospective home builders could be an important factor in the trend of business in 1954. On the basis of the experience of persons who wanted to build during the last five years, most of those who were persuaded to postpone building now are bitterly disappointed that they did not go ahead with their plans. Those who did build are practically 100 per cent in agreement that they acted wisely.

Of course every household building project is a case by itself, but, speaking generally, the advice to one really needing a home is to buy it now. Likewise, the answer to the worker who has a little money saved up but who is hanging on to it because of a fear of layoff is to play it safe. Don't spend recklessly. Spend wisely, and if refrigerators, automobiles, dryers, washers and other products get into a competitive dither which results in unusual bargains, take advantage of them.

* * *

EMPHASIZE OVERTIME: In many industrial centers there is an odd discrepancy in the number of hours worked per week in various plants. For instance, one finds long-established manufacturers of metal products working three or four days a week while others in similar lines of business and operating under almost identical circumstances are working five or even six days a week.

A study of the "Help Wanted, Male" advertising columns of the newspapers also reveals a surprising amount of emphasis on overtime. Time and time again employers seeking diemakers, machinists or other machine operators either specify a work week of 48 to 54 hours or otherwise stress overtime.

* * *

BETTER BREAK FOR ALL: On page 61 is a chart showing the average hourly wages of the industrial workers in 14 nations. As would be expected the United States leads with an average of $1.78. Our northern neighbor Canada is second with $1.36. Sweden is a poor third with $.75, and New Zealand fourth with $.69. The traditionally strong industrial countries are well to the rear. The average hourly wage in the United Kingdom is $.47, in France $.46, in Germany $.44, in Italy $.37 and in Japan $.19.

What this means to intelligent people is that the United States is the only nation that has discovered the secret of competitive enterprise that affords consumers tremendous buying power. In spite of all the propaganda from scores of sources, the USA is one of the few nations where the ordinary man is getting a much better break than in previous decades.

* * *

FOR FEWER DECIBELS: In many plants in the metalworking industry, noise is accepted as an inevitable and necessary evil. Until recently, few attempts were made to reduce or eliminate it. However, a few companies have begun to study the problem intently and, as a result of their findings (p. 94), it can be stated positively that there are numerous ways in which the intensity of noise can be lowered so that working conditions can be improved and production increased.

The noise in a grinding room has been measured at 102 decibels. That of thunder, artillery firing and riveting usually ranges above 100 decibels. An air-raid siren registers about 130 decibels at close range. It should be remembered that the decibel scale is logarithmic. Hence a reduction of from 6 to 10 decibels at the 100 level can mean a 40 to 56 per cent drop in loudness.

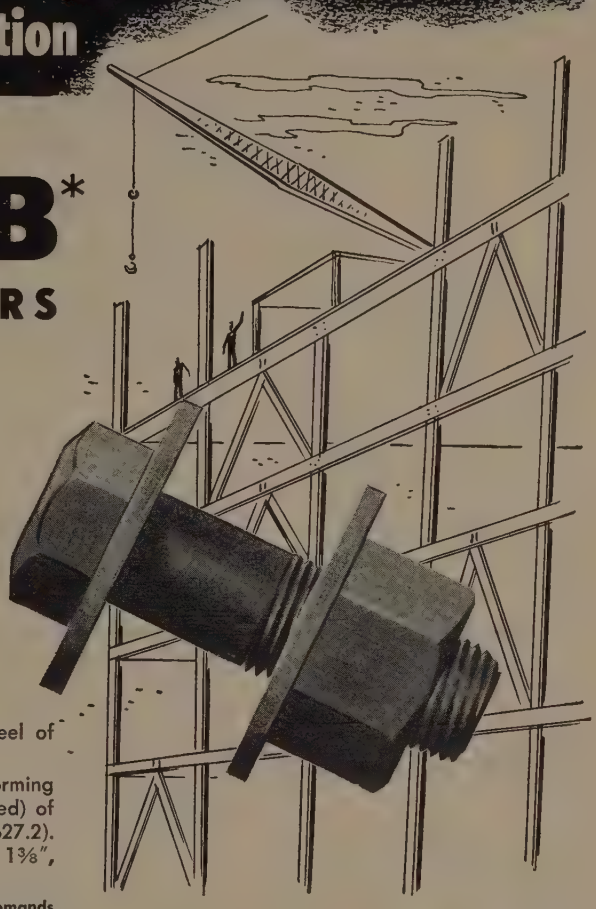
Thus by segregating some noisy operations, using acoustical materials intelligently and by adopting numerous other sound-deadening measures, it is possible to exercise considerable control over industrial noises.

There IS Something *NEW* and *BETTER* in WASHERS for Structural Steel Fabrication

...Introducing

MIL-CARB*

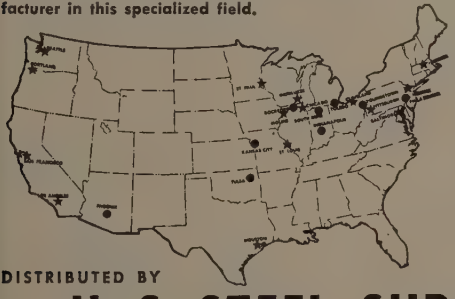
CARBURIZED WASHERS



The rapidly growing recognition and acceptance of the many advantages of Bolted Structural Joints has created a positive demand for a vastly better type of washer—equal in tensile strength and holding power to the best bolt-and-nut assemblies. The new MIL-CARB Washer definitely meets this need.

- MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel, insuring uniform quality control, always equal to the rigid specifications (ASTM Designation: A325, applying to nuts, bolts and washers).
- Proper carburizing permits *securing* and *permanently holding* the desired tension in high-strength structural bolting. Uniformity of hardness is assured by absolute grain-size control.
- MIL-CARB Washers overcome inherent weaknesses often present in heat-treated washers fabricated from steel of questionable quality.
- MIL-CARB Washers are flat and smooth, dimensions conforming to current requirements for heavy plain washers (carburized) of the American Standards Association (ASA Designation: B27.2). These washers are available in six sizes, from ⅝" to 1⅜", packed in 200-lb. kegs.

Here, in complete harmony with the constantly growing and critical demands of the structural steel building industry, is a Washer made to the exacting quality standards both of the industry itself, and the world's leading manufacturer in this specialized field.



MIL-CARB Washers are available through all U. S. Steel Supply distribution outlets.

★ Warehouses

● Sales Offices

DISTRIBUTED BY

U. S. STEEL SUPPLY DIVISION

UNITED STATES STEEL CORPORATION

208 South La Salle Street • Chicago 4, Illinois

*TRADE MARK

NO BOLT IS ANY BETTER THAN ITS WASHERS

SINCE 1887

WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

2103 SOUTH BAY STREET • MILWAUKEE 7, WISCONSIN

A 7902-1PC

how would you rate the galvanized sheets you're now using?

		YES	NO
FORMABILITY	Does the sheet take lock seaming and other forming without cracking, flaking or peeling of the coating?	____	____
	Are we getting too many rejects of formed pieces?	____	____
COATING	Is thickness of coating uniform throughout each sheet with no areas where zinc was "built-up"?	____	____
TEMPER	Is the temper right for my particular type of jobs?	____	____
SPANGLE	Is the spangle bright and uniform on each sheet?	____	____
STRENGTH	Is the base metal a quality steel . . . will it give long service even under severe conditions?	____	____
UNIFORMITY	Can every sheet in every bundle be depended on for the same quality and performance?	____	____

for the right answer on every count

specify NEW INLAND TI-CO ® ...with the zinc coating that rolls with the punch!

Look for this stencil on all your galvanized sheets.

TO GET THE WHOLE STORY

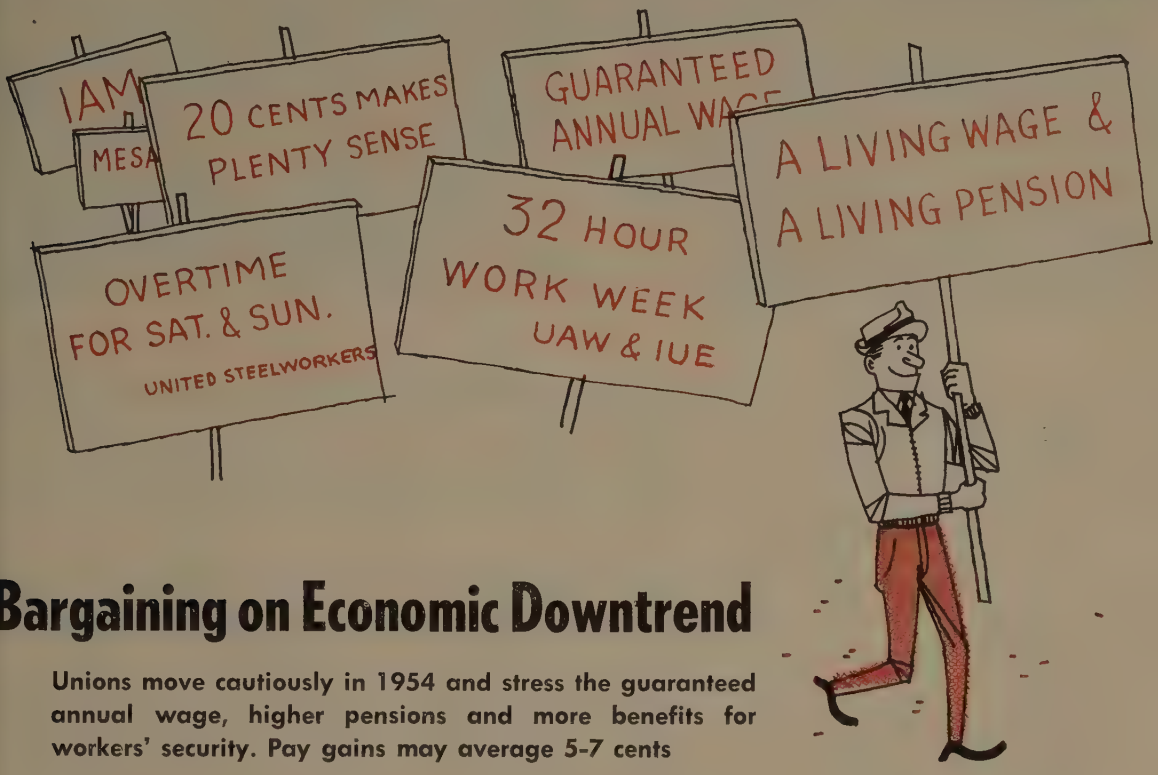
Write for our new Ti-Co catalog. It tells how Ti-Co can help you produce better galvanized products for less—and turn out new products not practical with ordinary galvanized sheets.

Ti-Co was developed especially to meet your problems. It's galvanized by a patented, continuous process that results in a tighter, more uniform coating . . . takes toughest forming without cracking, flaking or peeling of the zinc coating. Ti-Co costs no more!

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • St. Louis • Davenport • Kansas City • Indianapolis • Detroit • New York



Bargaining on Economic Downtrend

Unions move cautiously in 1954 and stress the guaranteed annual wage, higher pensions and more benefits for workers' security. Pay gains may average 5-7 cents

LOOK FOR modest wage settlements in 1954. Lagging production and employment are making employers more resistant to large increases in labor costs. Unions are more cautious.

Most labor settlements to date in 1954 have fallen in a 5 to 8-cents-per-hour range. Agreements negotiated for 20 companies by the Associated Industries of Cleveland granted increases ranging from less than one cent to 9.8 cents. The weighted average for all companies was 5.8 cents. In only three of the 20 companies were fringe concessions granted.

Some Higher—A few settlements were made at much higher figures. United Steelworkers-CIO won a 15-cent settlement from Continental Can Co. and American Can Co. International Association of Machinists-AFL obtained an 11-cent wage increase and other benefits from Pratt & Whitney.

About 10 per cent of contract negotiations resulted in settlement at no increase. Textile plants generally are settling at the 1953 figure. In a few straggling instances, workers have agreed to a wage reduction.

Big Tests Ahead — The agreements signed in January and February do not necessarily indicate a pattern. They only are straws in the wind. In no case has a major union come to grips with a major industry. The larger tests will come in April when General Electric and Westinghouse start negotiations with the electrical workers' unions and in June when the basic steel producers sit down with the United Steelworkers-CIO to revise their contract.

High on the demand list of the steelworkers will be a request for more liberal pension benefits and an overhauling of the insurance program. When the United Auto Workers-CIO last year won pension benefits of $137.50, a goal was set for the steelworkers to equal or better. The steelworkers will be asking for larger pensions—probably $100 or even $150 in addition to social security. They won't get that much, but they probably will be unwilling to settle for less than the $137.50 minimum, including federal old-age retirement benefits, won by the autoworkers. They may hold out for $150, including social security.

Some Gain Probable—The steel industry may lend a reasonably sympathetic ear to the union plea for pension liberalization. But pensions cost a lot of money, and any liberalization program could quickly take all the increase the steel companies will be willing to grant in this year of lowered operations.

A show of strength will be made by the steelworkers on the guaranteed annual wage issue. This demand has been on the union's agenda since 1943 but never has been seriously pressed.

While the demand still is called a guaranteed annual wage, it actually has been modified to a request for supplementary unemployment compensation. Plan calls for a contribution by employers to a trust fund out of which unemployment benefits, supplementary to state benefits, would be paid. Employers' liability would be limited to the amount in the fund.

In a demand made to Aluminum

AVERAGE NUMBER OF BENEFITS CARRIED:	AVERAGE COST OF BENEFITS PER COMPANY
10.3 PER COMPANY	**31 cents** PER MAN-HOUR

AVERAGE HOURLY COST OF EACH EMPLOYEE BENEFIT

From a survey of 160 companies by Associated Industries of Cleveland

	1951	1953	Companies Reporting in 1953
Bargaining and grievance time	$.0026	$.0029	72
Bonuses	.0450	.0401	60
Cafeterias	.0106	.0096	41
Credit unions	.0017	.0008	9
Gifts and other rewards	.0091	.0063	70
Holidays	.0343	.0372	148
Insurance (Includes life, hospitalization, medical, surgical, sickness and accident)	.0228	.0283	134
Old age and survivors insurance	.0248	.0270	150
Unemployment compensation	.0166	.0152	150
Workmen's compensation	.0108	.0108	152
Lunch periods (paid)	.0167	.0204	32
Payment to jurors, National Guard, etc.	.0026	.0018	22
Pensions	.0678	.0808	44
Profit sharing	.1016	.1073	17
Recreational activities	.0052	.0055	97
Rest periods (paid)	.0416	.0453	74
Severance pay	.0037	.0020	9
Vacations	.0528	.0674	155
Wash-up time	.0252	.0289	102
Welfare funds (money, flowers, etc.)	.0038	.0030	22
Miscellaneous	.0221	.0134	45
Average number of benefits per company	9.9	10.3	
Average cost of benefits per company	$.2477	$.3083	

Co. of America, the union proposed a 10-cent-an-hour contribution by employers, integration with the federal-state unemployment compensation program to raise average benefits from the present 33 per cent of wages to slightly above 60 per cent of wages and to extend the period of coverage.

Fuze—Should the union make an all-out drive for the annual wage proposal this year, a steel strike is possible.

A steel strike in 1954, when steel users' inventories are curtailed, could cause more distress among metalworking companies than was caused by the two-month 1952 stoppage. Steel inventories at that time were high and relatively little production was lost.

Compromise—Independent labor observers believe the steelworkers will stage a big show for the GAW, then possibly withdraw it temporarily or accept some compromise. The compromise could be agreement to submit the issue to joint study for a year.

A Long List—The steelworkers will bring other demands to the negotiating table. They, in fact, will have a long list. Those to be pressed most seriously will include a demand for overtime pay on Saturday and Sunday as such, the usual demand for a straight wage increase, and a request for the extension of incentive programs.

Steel producers probably will define the limits of the game early in the negotiations. The increases the employers will be willing to grant will not cover even the most urgent of the union's demands.

Major demands by the electrical unions—the IUE-CIO and the UE-Ind. — on General Electric and Westinghouse will include the guaranteed annual wage, substantial wage increases, higher minimums, more holiday pay, changes in incentive schedules and sick leave benefits.

Probable settlement: Perhaps a nickel in wages and some slight concession in fringe benefits. The companies will be firmly resistant to annual wage demands.

Reuther Quiet—On the national scene, the United Auto Workers do not figure too prominently in 1954 settlements. The big contracts come up in 1955. Hundreds of small contracts with automotive suppliers are being negotiated from day to day. Issues are wage adjustments and fringe benefit adjustments. Many of the contracts are being settled on the basis of 5 to 7-cent wage increases.

UAW and CIO President Walter Reuther may be satisfied to busy himself with the unemployment situation through 1954. Some observers believe he may grab the spotlight with a demand for a 32-hour week if employment continues to drop.

Labor Surplus Areas: Six Added

Six new areas were placed in Group IV (surplus labor area) by the Labor department last week. This makes a total of 59 labor market areas in the nation in which unemployment is 7 per cent or more of the total labor force.

The new areas placed in the classification are: Davenport-Rock Island-Moline districts in Iowa and Illinois; South Bend, Ind.; Battle Creek, Mich.; La Crosse, Wis.; Hudson, N. Y.; and Welch, W. Va.

Hanna Sells Sintering Plant

American Steel & Wire Division, U. S. Steel Corp., has purchased the DeGrass, N. Y., sintering plant of M. A. Hanna Co., Cleveland. AS&W will erect the plant at its Central Furnace and Docks in Cleveland. Dismantling of the plant will get under way in May, and officials expect to have it in operation at its Cleveland location in the fall.

U.S. Studies Defense Plant Mothballing

Private facilities may be kept standing with key personnel intact. Business declines and more peaceable conditions make some defense plant operations difficult

WILL IT BE NECESSARY for the government, in order to maintain the mobilization readiness base, to inaugurate a program for mothballing certain privately owned plants essential to weapons production?

The question is being pondered by the administration. It arises because defense plants cannot always be operated consistently under peacetime conditions and because the current dip in business, if continued, might force shutdowns at some defense plants, with resulting dispersal of key operating staffs.

A Law Needed—There isn't anything in the present Defense Production Act to permit mothballing of privately owned facilities by the government. But should maintenance of the mobilization readiness base require such treatment, the administration could ask Congress for the necessary authorization and appropriation. Such a denouement is reserved for the future, since a lot of exploratory study must be conducted before a plan can emerge.

One of the fields which definitely will be reviewed in this study is steel. Included will be all sectors of the industry from raw materials to finished steel products. The investigation will be conducted by the Office of Defense Mobilization's new Iron & Steel Section to be headed by R. J. Wysor. The study will aim at determining the extent to which facilities in the industry may be out of balance and those products which are primary defense needs in time of war. On the basis of these findings would come any possible mothballing program.

Flemming Speaks — Current thinking on the problem was outlined by ODM Director Arthur S. Flemming in a speech before the Economic Club of Detroit. He emphasized the necessity for keeping key operating personnel at defense plants intact—since a defense plant without trained men to run it is useless.

"Current production helps, of course, to maintain the base," said Dr. Flemming. "It is clear, however, that if we should rely solely on current production that the base would, gradually in some instances and rapidly in other instances, disintegrate. In connection with many items production is declining. Unless we should become involved in hostilities this decline will continue. Consequently, if we are to have a strong and effective mobilization base we cannot count on current production."

Program Coming—He points out: "We should develop a program that will insure the maintenance of our base and then look upon current production as an extra dividend contributing to the strengthening of that base.

"We should consider, for example, the possibility of entering into contracts with management that will insure the retention of a hard core of managers, engineers and skilled personnel who have been engaged in defense production work . . . if they are not available when it becomes necessary to convert, we all know that months of valuable time may well be lost. Money spent by the government on this phase of a maintenance program would be money well spent."

Help Needed—To assist ODM in developing the various phases of this stepped-up program, Dr. Flemming is considering appointment of "a committee of men who have faced these problems in the past and who can assist the government in making it possible for this nation, for the first time in its history, to maintain a strong mobilization base that could be quickly converted to war production."

The mothballing and personnel maintenance study is to be part of the over-all full mobilization planning on which the ODM is working in co-operation with the Department of Defense and other agencies of the government.

Army Leasing Grant Held Up

The Department of Defense has withdrawn the Army recommendation that $9.7 million of production equipment and facilities in the medium tank part plant be leased to Brown & Root Inc., Houston, Tex., for nondefense work. It is holding the application in abeyance pending further examination. Action of the Defense department was taken after receipt of a series of questions from ODM as to the circumstances involved in the proposed leasing deal.

Skil

You, Too, Can "Do It Yourself"

Possibilities for metalworkers in this fast-expanding market are nearly unlimited. Diversification or slight adaptation of present products may be your answer

"DO IT YOURSELF." That tag for today's hottest market development could also be the slogan urging you to enter the field. There's still opportunity to supply the mounting needs of hobbyists and weekend mechanics.

Estimates of the do-it-yourself market put the demand at $3.5 billion for 1954. Those dollars won't all go to metalworking, but enough will to justify more than a cursory glance at the possibilities.

A Good Example — The power tool industry offers one example of how to cash in on the trend. Before World War II most power tools were found in commercial applications. With the do-it-yourself trend taking hold about 1947, power tool producers promoted their products on the do-it-yourself theme from sales of about $6 million that year to nearly $150 million last year.

Reynolds Metals Co., Louisville, is doing unexpectedly well with its do-it-yourself aluminum supplies for hardware dealers. Reynolds markets aluminum sheet, tubing, rods, bars, angles and a variety of fasteners. The aluminum can be worked (Reynolds uses a special alloy) as easily as wood. Reynolds puts out booklets showing how to use the aluminum and suggesting things to make—household racks, novelties, furniture, auto accessories, lawn furniture, window awnings.

More To Come—"Since we introduced these products last fall," Reynolds says, "we've exceeded expectations by 10 per cent. Over 5000 hardwares have ordered the supplies, and we expect to nearly triple that figure by the end of 1954."

A hardware owner in Pennsylvania saw the same opportunities in cold-drawn steel rounds, angles and flat stock. He purchased some abrasive cutting equipment and set up his own factory operation. Purchasing the stock from nearby steel mills, he cuts it into home-use sizes and sells it in a display rack to hardware dealers.

Possibilities—Many manufacturers are finding that with simple adaptation of their present lines they have a do-it-yourself product. DeWalt Inc., Lancaster, Pa., developed its reputation on its "Power Shop" unit for commercial enterprises. The unit, which has a tilt arbor saw, router, drill press, grinder and other units, carried motors up to 15 hp for heavy lumber yard operations. The company cut down the size of the "Power Shop," equipped it with a half horsepower motor and placed it on the market for the home workshop.

What's behind the do-it-yourself drive? Experts list these factors: 1. High labor costs; 2. more leisure for hobbyists and weekend mechanics; 3. more home ownership; 4. more know-how by laymen; 5. heavy encouragement of the trend by manufacturers.

Putting It Across—One of the most popular promotions is the do-it-yourself show. Orkin Exposi-

Do-It-Yourself Products Should Meet These Tests

- Product should have a practical application for home, yard, automobile or hobby use.
- Products in kit or make-it-form should be easy to assemble. Detailed, simple instructions should be included so that failure is next to impossible.
- Be sure product is packaged attractively and easy to handle.
- Price is important. Price concession gained in "doing it yourself" is a prime sales factor.

tions Management, New York, has 20 shows scheduled for this year in cities across the nation. Its show in Chicago last fall attracted over 107,000 persons. Hobby, hardware and home shows all present fine do-it-yourself possibilities.

Anything Goes — Anything belongs in the do-it-yourself market that a member of the family can use to make an end product. Sewing machines and cloth belong in the category just as much as tools for the workshop. End products range from small corner shelves to bathrooms to complete homes in today's do-it-yourself market. Akin, too, is the hobby market with its model airplanes for junior to fishing tackle kits for father. Sears, Roebuck & Co., says much of Sears' sales have always been based upon the so-called do-it-yourself items.

Here's a word of caution: In studying your company's do-it-yourself potentialities, consider all the implications. A large midwest producer of corrugated quonset-type buildings says it's staying away from the do-it-yourself idea. "In all probability," officials explain, "there are some laymen who could erect some of our products. But we feel that there is a danger of customer dissatisfaction if he does not do a good job. By selling the completed building, we know it will be erected properly and the customer will be completely satisfied."

GSA Changes Buy-Sell Policy

General Services Administration made three changes in its buying and selling policy for columbium and tantalum ores:

1. Current 100 per cent bonus over market price which GSA pays for the ores will be passed on to industry customers.

2. GSA will accept delivery of tantalum in 1000-pound lots instead of previous 2000 pounds to enable small producers to make more frequent deliveries. Minimum deliveries for columbium remain 2000 pounds.

3. Stockpile grade tantalum or Grade 1 columbium will no longer be available to industry customers for purchase from the government.

RCA

ELECTRONICS OUTPUT

1954 (est.)	$5.0 billion
1953	$5.0 billion
1952	$4.2 billion
1944	$4.6 billion

Source: Radio-Electronics-Television Mfrs. Assn.

Electronics Mark Up Record Sales

Electronic equipment producers did $5 billion worth of business in 1953, will at least equal that again this year. Industrial electronics is a growing market

PUTTING ELECTRONS to work was record-breaking business in 1953.

Electronic equipment manufacturers produced $5 billion worth of goods last year, $800 million more than in 1952 and $400 million more than in the previous peak year of 1944.

Optimistic—That was the picture presented recently to security analysts by Robert C. Sprague, chairman of the board of Sprague Electric Co. and of Radio-Electronics-Television Manufacturers Association. As for 1954, Mr. Sprague said: "I shall be surprised if the electronics industry does not chalk up another increase in total sales."

All the major markets for electronic equipment shared in the growth of sales last year. In television and radio, factory sales were $1.4 billion compared with $1.3 billion a year earlier. Retail sales of TV receivers increased slightly to 6,375,000 from 6,145,000 in 1952, and radio sales rose to 12.2 million units for a gain of 12 per cent.

Rising Further—Military purchases of electronic equipment of $2.8 billion in 1953 was 60 per cent of the peak military volume of World War II. Cutbacks and stretchouts of general military programs are not likely to stop a further rise in defense volume of electronic sales for 1954. Importance and need for electronics increase as both weapons and counter-weapons become more complex, faster.

Other markets, making up the remaining $800 million in electronics sales for 1953, are the industrial controls and apparatus field and the replacement parts field. Sales of electronic equipment to industry are large, running into hundreds of millions of dollars a year, says Mr. Sprague. "Although this segment of our

Press Completes Crankshaft Team

Last of a battery of three 6000-ton mechanical forging presses is erected at Chrysler Corp.'s Dodge Forge Plant in Detroit as latest step in a five-year modernization program. The presses will supply the entire crankshaft requirements for Plymouth, Dodge, DeSoto, Chrysler and Imperial cars and Dodge trucks

business may not equal the dollar importance of radio-television and military equipment for a good many years, its rate of growth may well be the greatest of all."

More the Better—Replacement markets already account for sales of about $500 million and should increase greatly to both civilian and military customers as the large new equipment shipments of the past two or three years begin to require replacement parts.

Looking at the prospects for 1954, Mr. Sprague foresees a retail market for black-and-white TV of close to 6 million sets and production of about 5.8 million sets. Where premature fanfare for color TV hurt black-and-white TV sales in late 1953, more realistic information will unshackle black-and-white sales in 1954. Then, too, of the 27 million sets now in use, only about 3.6 million are equipped for UHF reception; only about 30 per cent of the sets in use are in screen sizes above 17-inch; and 20 per cent of the sets in use are probably over 4 years old. In radio, demand for auto sets may drop to 4 million in 1954, but the market for all types of radios should approximate 11 million sets.

New Ceiling?—Stacking this 1954 radio-TV volume of at least $1.3 billion on top of about $3 billion in military business and about $700 million in industrial and replacement business, Mr. Sprague sees the electronic industry's business volume pushing on the $5-billion ceiling established last year. And diversity of markets will keep the buoyancy in electronic sales, he believes. "Our industry will continue to be a strong-growth industry for many years to come."

New Battery for Civilians

Sonotone Corp.'s nickel-cadmium storage battery will soon be offered on the civilian market. So says L. Grant Hector, Sonotone vice president. Don't look for it in your automobile right away, however. Said to last four or five times longer than conventional lead-based batteries, the new battery, says Mr. Hector, would cost at least five times as much as a lead battery if made for a passenger car.

Last Steps Taken

Detroit Steel completes $60-million expansion at its Portsmouth Division

FINAL STEPS in Detroit Steel Corp.'s $60-million modernization and expansion program at its Portsmouth Division were completed last week.

The new open-hearth shop, consisting of four 250-ton furnaces, was placed in operation when M. J. Zivian, president, tapped the first heat of molten steel. Under way for nearly 4 years, the expansion program was designed to double ingot capacity.

Also in Operation—At the same time the company's new 44 x 100-in. high-lift blooming mill and 10 new 18-foot diameter soaking pits were also started.

Railroads Win Large Write-offs

Six large certificates of necessity for railroad freight cars and diesel engines were granted between Jan. 28 and Feb. 10 by the Office of Defense Mobilization. The rapid tax write-off grants were among 57 approved by ODM for new or expanded facilities amounting to $91.6 million.

The railroad certificates were: Western Maryland Railway Co., Baltimore, one certificate for $1.1 million with 55 per cent write-off allowed and another certificate for nearly $5 million, 70 per cent allowed, for diesel locomotives and freight cars; Guy A. Thompson, St. Louis, trustee for Brownsville & Mexico Railway Co., $1.4 million for diesel engines, 55 per cent allowed; Guy A. Thompson, St. Louis, trustee for International-Great Northern Railroad Co., $1.4 million for diesel engines, 55 per cent; Northern Pacific Railway Co., St. Paul, $1.2 million for freight cars, 70 per cent allowed; General American Transportation Corp., Sharon, Pa., $3 million for tank cars, 70 per cent allowed.

Other large metalworking certificates issued included: General Electric Co., Schenectady, N. Y., $1.9 million, 40 per cent allowed, for research and development of military items; Aluminum Co. of America, $1.2 million, 65 per cent,

for finished alumina products at its bauxite works, Bauxite, Ark.; U. S. Steel Corp., $1.9 million, 45 per cent allowed, for blast furnace coke and by-products at its American Steel & Wire Division, Cleveland; Shenango-Penn Mold Co., Sharpsville, Pa., $1.7 million, 65 per cent allowed, for large gray-iron castings.

Nitrogen Expansion Excessive

Nitrogen expansion goals set by the government are too high, spokesmen for the nitrogen industry have just informed the Business & Defense Services Administration.

Producers say that's because the goals are predicated upon a 3-year-old survey of requirements which is now out of date. The goals referred to are one for 1955 of 2.9 million tons and one for 1957 of 3.5 million tons.

Machine Tool Orders Gain

New orders for machine tools took an upswing in January, bringing an end to the steady decline since last August. National Machine Tool Builders' Association, Cleveland, reports its preliminary new order index for January is 173.7, compared with 149.8 for the previous month (1945-1947=100).

Shipments, too, bounced up for the month with the index pegged at 319.6 compared with 301.4 for December.

Western Steel Engineers Meet

More than 400 steel plant engineers gathered for the first western meeting of the Association of Iron & Steel Engineers in Los Angeles. Early birds were invited to tour steel plants in the vicinity.

One of the technical highlights was a recount of the advances in western steel production. This paper was presented by W. B. Wallis, president, Pittsburgh Lectromelt Furnace Corp.

Future direction their industry would take was pointed out by W. J. McClung, vice president, Bethlehem Pacific Coast Steel Corp., who said "We expect to find the greatest development during the next decade in the manufacturing class of trade."

Procurement Policy on Data Use Defined

Three clauses are set up to regulate the government's use of contractors' technical data. Proprietary information claims will be handled by specific set of instructions

THREE CLAUSES will now govern the government's use of contractors' technical data under armed services procurement: Limited right to use, unlimited right to use, and part limited and part unlimited right to use.

The clauses are set up in "Part 3—Technical Data" of the revised policy of the Armed Services Procurement Regulation which replaces the much-criticized "Little d" subparagraph, "Section IX."

The Policy—"Part 3" does not differentiate as to the rights to use of contractors' data with respect to experimental, developmental or research work. It proceeds on the policy that in advertised contracts, regardless of subject matter, only limited rights shall be obtained. In negotiated contracts, unlimited rights shall be obtained unless the contractor asserts a claim to rights in proprietary information. Premises of the policy are: 1. It is better for the government if its rights in technical data are unlimited, and 2. many contractors will have no objections to giving government unlimited rights in technical data when they have no proprietary information.

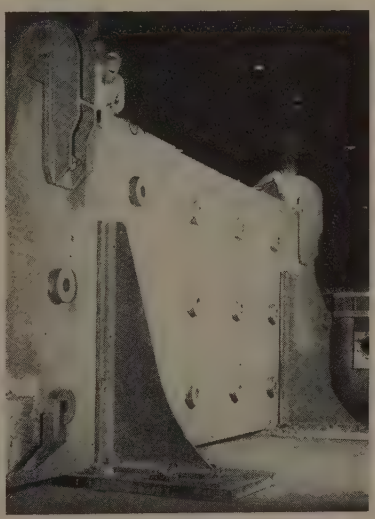
Under the "part limited and part unlimited" clause, negotiated or advertised contracts may be made by which the government has limited rights to use some technical data and unlimited rights to other data.

Proprietary Information — Included in "Part 3" is the subject of proprietary information in the possession of a contractor who desires to safeguard it from competitors. A new feature, this provision is based on the premise that the Defense department should "recognize and take reasonable steps to protect the rights of the contractor in proprietary information."

Technical data under "Part 3" consists "of writings or reports, books, bills of material, drawings, blueprints, photographs, or similar reading material which discloses technical information regarding the operation, maintenance, evaluation, testing or manufacture of supplies, construction work or facilities furnished or to be furnished by the contractor." Proprietary information pertains to the contractor's previously developed manufacturing processes, materials, know-how, trade secrets, construction details and the like which he would safeguard in the regular course of business.

"Part 2" of the revised "Section IX" concerns copyrights. It provides that the "Defense department recognize that the owner of copyrighted material has a property right . . . and . . . that copyrighted matter will not knowingly be incorporated in (government) publications . . . except with the written consent of the copyright owner."

The new "Section IX" (for Part 1, see STEEL, Feb. 22, p. 57) has been referred to the three armed services for review. No further changes are expected.



Padding the Press

At Bethlehem, Pa., plant of Bethlehem Steel Co., welders attach pads to 95-ton crosshead support forging for 35,000-ton die forging press, a unit in Air Force heavy press program

Legal or Illegal? BDSA Studies Antitrust Advertising Puzzle

UNDER WHAT circumstances may you advertise the product of a customer without violating the Clayton Act?

That question has been put to the Commerce department's Business & Defense Services Administration. BDSA is studying it in the hope of formulating an answer soon. The question is pertinent for many manufacturers are doing such advertising—particularly producers of such basic raw materials as steel, chemical products and the like which can be given more glamor and prestige by featuring fine consumer products into which they are made. The philosophy is that if a particular make of steel bars, copper wire or sulphuric acid or other raw material can be used in the manufacture of the products temptingly displayed in the advertisement, they automatically are stamped as O.K.

The question was raised by a number of chemical manufacturers whose products are widely used in making consumer products. The attorney for one of them explained that not all consumer products lend themselves to such advertising, so that it is not feasible or desirable to publish such advertising on the products of every one of his client's customers. It is practicable only when the product has some special appeal to a large group, such as housewives.

That type of advertising, said the attorney, might be construed as discriminatory against customers whose products are not advertised. In doing such advertising, he said, the chemical industry is taking a calculated risk of getting into trouble. What can the BDSA do to take his client and the other chemical companies off the hook?

FTC To Be Heard From . . .

A ruling, of course, will be needed from the Federal Trade Commission, the agency responsible for enforcing the Clayton Act. Based on the language of the act itself, and recent decisions of the commission, it is conceivable that the commission could issue complaints against companies advertising the products of some customers without making such advertising available to all other customers. For Section 2(d) of the Clayton Act provides that payments or allowances for advertising and promotional services must be "available on proportionally equal terms" to all competing customers.

It is felt by many that the issue here could be decided by determining whether the money paid for advertising space featuring a customer's product is to be construed as an advertising or promotional allowance to the customer. If such a ruling were made, it automatically would follow that all other customers are entitled to the same or equal treatment.

The Matter of Precedence . . .

That conclusion seems to be warranted by some of the commission's recent decisions. In one action, complaints had been issued against the big three soap manufacturers on the ground that in granting promotional allowances they were guilty of unlawful price discriminations. But the commission found that the soap companies offer payments to all customers for soap advertising and that they offer alternative promotional allowances to those customers who do not use the advertising allowance. The point was that all customers received equal treatment. So the commission dismissed the complaints.

FTC Broadening Its Preclearance Procedure

WORRIED about possible federal legal action against you for violating some antitrust law?

You may be able to set your mind at rest by simply asking the Federal Trade Commission what it thinks. While the commission has not yet set up its proposed Bureau of Consultation, and will not do so until Robert Heller & Associates Inc. submits a report on how FTC should reorganize to improve its efficiency, the consultative function has been increasingly exercised of late.

In particular, manufacturers are coming in more frequently to find out whether mergers in which they propose to enter, or acquisitions which they plan to make, are in conflict with Section 7 of the Clayton Act. This is the antimerger section which became part of the law in December, 1950. These inquiries are handled by the Bureau of Antimonopoly, of which Joseph E. Sheehy is director and Everette MacIntyre assistant director.

After listening to the facts in the case, the bureau usually expresses itself in language like the following: "We feel the proposed action would be illegal and in the event of its consummation probably would advise the commission that a complaint was in order," or "we see nothing in this plan that would force us to recommend the issuance of a complaint."

The consultative function also is showing up elsewhere in the commission, notably in the Bureau of Industry Co-operation, of which James A. Horton is director.

redrawing a round into a square by Hydroforming

MATERIAL: 11" dia. blank of .051" 2SO aluminum.

FIRST OPERATION: Draw a 5" dia. cup, 4½" high. At completion of the draw, but before retracting the punch, a ring is placed over the part which, when pressure is re-applied, trims the cup flange. The trimmed cup is stripped as the punch is retracted.

REDRAW OPERATION: One continuous draw forms the cup into a box, 3⅛" x 3½" x 5¾" high.

Here's a dramatic, new *switch* to the "can't fit a square peg into a round hole" story . . . the Cincinnati 12" Hydroform version: Draw a round cup, then redraw it, producing a deep, rectangular box!

Try this on your draw press in *two forming operations* . . . then compare your conventional tools—their cost and complexity—with these: A punch and a draw ring to produce the cup . . . a ring to trim the cup flange . . . a redraw sleeve with square opening, which is placed into the first operation draw ring to accommodate the predrawn cup . . . and a finish punch to form the box. Of these five, simple Hydroform tool elements, only the finish punch and the internal opening of the redraw sleeve could not be machined on a lathe.

This is another example of the *unique* drawing action—the *simplicity* and *economy* of tooling—the *savings* of operations—made possible by Hydroforming. Can your company use these Hydroforming advantages? Find out now, by calling in a Cincinnati Milling field engineer. For a description of the Hydroforming process and specifications of the 12", 19", 23", 26" and 32" machine sizes, write for Bulletin M-1759-2.

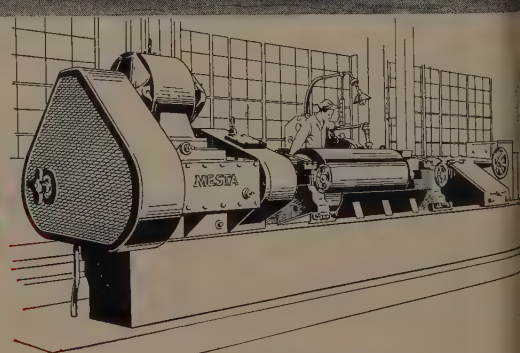
CINCINNATI Hydroform

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

MESTA

HIGH-SPEED COLD MILLS

MESTA 42" FOUR-HIGH, TWIN-STAND HIGH-SPEED SKIN PASS MILL INSTALLED IN A LARGE EASTERN STEEL PLANT

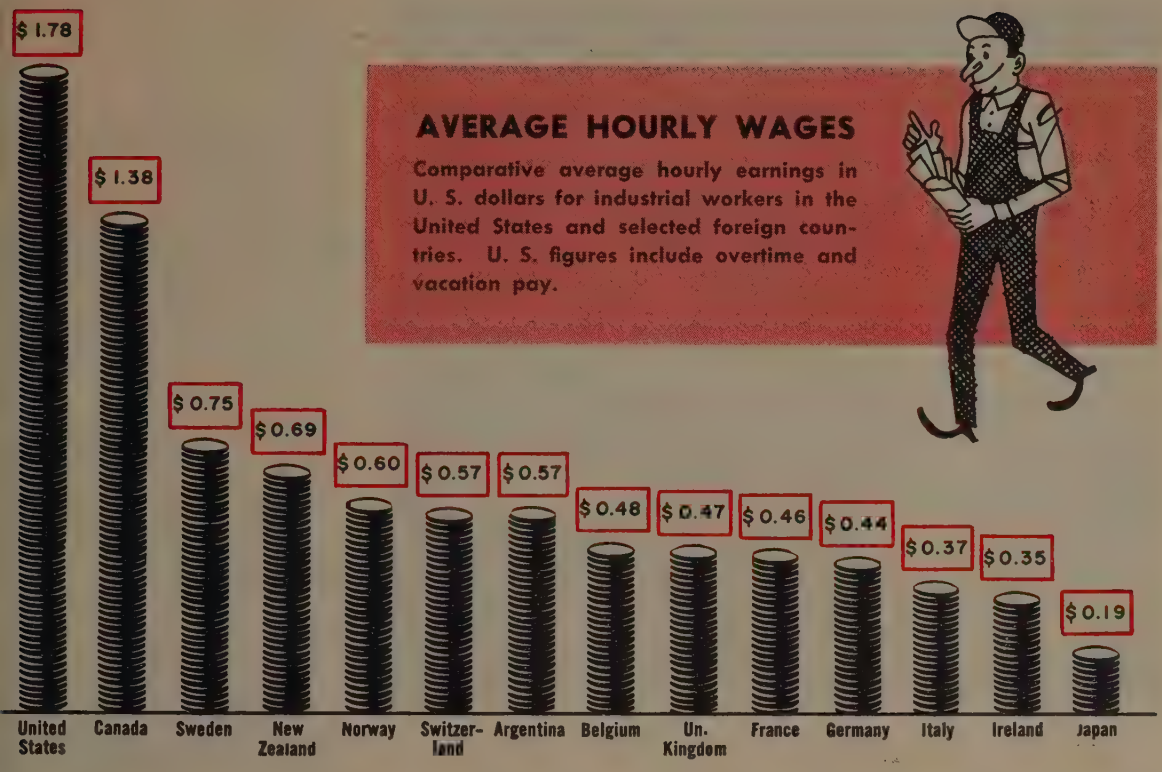


FINISHING A MESTA WORKING ROLL IN A MESTA HEAVY DUTY ROLL GRINDE

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



urce: American Tariff League Inc.

Jumping the Wage Gap Hard for Many U.S. Firms

ANY AMERICAN manufacturers need tariff protection to offset the wage gap despite general higher productivity in U. S. industry as compared with foreign industry.

That's the conclusion of a new merican Tariff League Inc. study hourly wages of employees in anufacturing industries in the . S. and foreign countries.

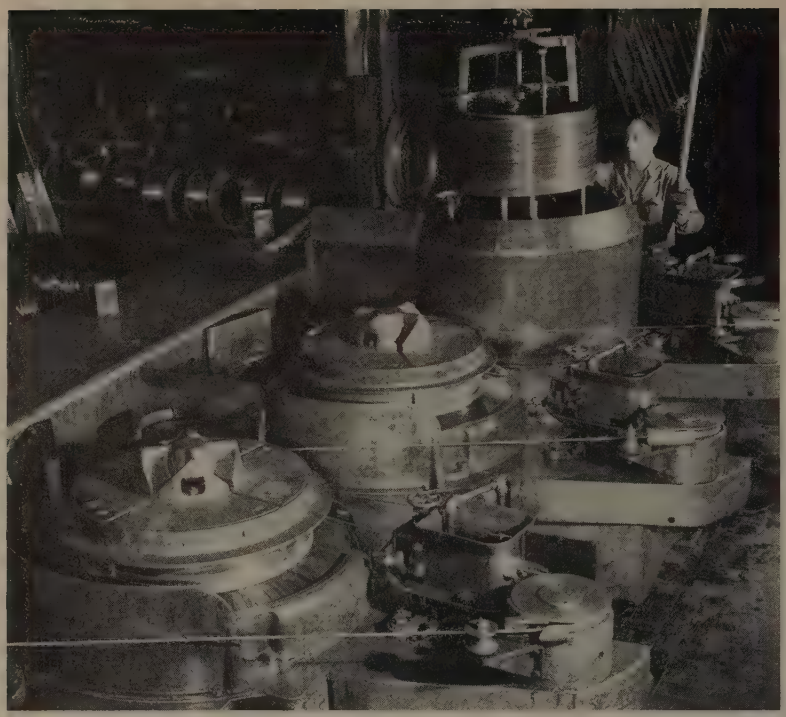
Unavoidable — In spite of higher roductivity generally, many merican industries with apparent w costs cannot avoid "bringing the receiving room door high bor costs in the form of raw or emifinished materials." In other ises, there is a high labor content equired in manufacture, the proc- ss being practically the same in ne U. S. as elsewhere in the world. et the U. S. worker earns sub- antially more per hour than his oreign counterpart.

Because the electrical product anufacturing industry presents a cross-section of various types of production techniques, foreign wage payments in that industry as a percentage of U.S. labor costs make a fairly representative comparison, says ATL. The National Electrical Manufacturers Association study on the subject showed Belgian hourly labor costs are 33 per cent of the U. S. average hourly earnings in that industry; France, 30.9 per cent; Germany, 22 per cent; Italy, 19.6 per cent; Japan, 9.9 per cent; Sweden, 33 per cent; Switzerland, 23.8 per cent; and United Kingdom, 28 per cent. The NEMA study results closely parallel the ATL comparison for all manufacturing industries as charted above.

Question of Data — As in its previous study on the size of world tariff walls (Oct.19, 1953, p. 55), the ATL wage gap comparison can be questioned on specific dollars-and-cents figures for particular countries. ATL is quick to admit that much of the hourly wage data for foreign countries is estimated to make it comparable to U. S. reporting. No complete official comparisons have been published by the U. S., foreign or international agencies. Some countries publish no useful statistics at all; others publish only fragmentary material.

Fringe benefits were not included in the U. S. hourly earnings figure. Cash benefits paid to foreign workers were included because they represent a substantial part of labor costs for foreign employers.

Borne Out—While admitting individual figures in this study are assailable, the reality of the wage gap is borne out by business practice, says ATL. Imports of business machines from Britain increased ten times to nearly $4 million worth in 1952 from 1950. Much of these imports comes from British subsidiaries of U. S. business machine firms.



Alcoa

Versatile Aluminum

Wire Applications Mount for Screening, Cable, Conductors, Fencing, Fasteners

"ALUMINUM WIRE prospects? Some of our potentially best applications haven't been developed yet!" That's how a sales executive sizes up the encouraging outlook for that versatile product.

"Best available statistics show tonnage of aluminum wire has increased considerably in the last six months," comments T. R. Bratcher, product supervisor at Reynolds Metals Co.'s Aluminum Division, Louisville, Ky. Uses are gaining in diversity, with new developments on the horizon.

Main Use — Prior to 1930, the bulk of aluminum wire consumed was in electrical conductor. Industry estimates show 41 million pounds of aluminum wire were shipped in that form in 1940. In 1952, aluminum producers shipped about 170 million pounds of aluminum electrical conductor, following with 185 million pounds in 1953.

Tonnagewise, aluminum wire's leading use is in stranded conductor, aluminum cable steel-reinforced, or ACSR wire. Officials of Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., add that use of aluminum by utility services for secondary distribution and service drops is gaining. "Workability, light weight and good electrical conductivity contribute to diversity of applications," Kaiser adds.

Constantly Growing — "While electrical conductor will remain a major consumer of aluminum wire, other applications are steadily increasing," remarks D. B. Miller, manager of wire sales, Aluminum Co. of America, Pittsburgh. "Major uses now include telephone cable, wire screening and fencing, screw machine stock and fasteners."

A mounting use of the light metal is in telephone cable. "Because of low material, shipping and installation cost, a leading manufacturer is definitely interested in increased use of aluminum for that purpose," Mr. Miller reports.

"Insect screening is made of aluminum in large quantities," Kaiser points out, "because of its durability, absence of corrosion and pleasing appearance, especially with aluminum window frames. Aluminum wire is growing in cyclone fencing, too."

More Fasteners—Alcoa expects to increase production of products such as nails and rivets early this year. "Advantages of aluminum nails include low shipping cost because of light weight," Mr. Miller adds.

"Reflecting a growing interest in aluminum fasteners, we're now producing a complete line of aluminum nails," reports Robert Ritchey, assistant general sales manager, Townsend Co., New Brighton, Pa. "We have an increasing number of inquiries about other aluminum fasteners."

For each major application of aluminum, wire engineers are developing two more. The versatile product is finding its place in clothing (zippers), in the kitchen (wire refrigerator shelves), and in the living room (television antenna wire). Growing industrial applications such as welding wire are matched by such domestic uses as clothesline and coat hangers.

New Goal—Next step forward for aluminum wire may be greater use in house wiring. Producers say trends in this direction are beginning. Already aluminum wire enjoys an important place in commercial and industrial wiring. "Our wire is now used in transformers and small horsepower motors," Kaiser comments.

Aluminum producers readily admit that new uses of aluminum wire don't appear overnight. Each is a result of long research activities. Currently in development stages are costume jewelry applications and bonds for rails. As a research engineer commented, "Durability, light weight and workability of the metal make aluminum right for these applications. We believe the same qualities will contribute to discovery of many new uses in future years."

Parcel-Post Steel

Ulbrich Makes a Big Thing Of Little Shipments

THE STORY about the well-aimed rifle carrying a more potent wallop than a shotgun is particularly true of Fred Ulbrich & Sons, Wallingford, Conn. Servicing a small, specialized market—custom stainless steel strip with minimum delivery time—the company has built up one of the most unique warehousing operations in the country.

Ulbrich specializes in one to 500-pound orders of cold-rolled stainless. Shipments (delivery time averages one week) go out air express, parcel post, railway express or truck to customers in all 48 states; yet the company has no salesmen on the road. Orders are handled by mail and telephone.

The Ace—Ace in the company's hand is its processing equipment. It can roll, slit, bevel, coil and do other operations the normal warehouse can't handle. With its equipment Ulbrich can supply its customers tailor-made stainless strip to exact temper, hardness, tolerance, finish, gage, edge and width.

The company normally carries an inventory of about 500,000 pounds of cold-rolled strip, but no hot-rolled inventory. Stocked are 430, 304 and 301 stainless in gages from 0.004 to 0.122 and a wide range of gages in 316, 321, 347, 403, 410, 414 and 420.

Ulbrich handles orders most warehouses don't want and can't handle profitably because of the small size. Actually, many of the company's orders come from warehouses. The need for Ulbrich's unique service and the company's ability to meet that need is demonstrated in its continued growth. Sales increased from $113,000 in 1949 to approximately $475,000 last year.

Bold Tax Changes Urged To Spur Uranium Production

CURRENT PRICE guarantees and bonuses for original production are not incentive enough to develop the nation's uranium production to keep pace with its expanding atomic energy program.

That's the opinion of Gordon Dean, former Atomic Energy Commission chairman, who is recommending changes in the federal tax laws to step up domestic uranium production.

Lift Taxes—Pointing out that individuals who discover an ore body of value soon get into the 80-90 per cent bracket and lose incentive to make other discoveries, the former AEC head proposes declaring a 3-year moratorium on income taxes for uranium miners. Impact on the government treasury would be unnoticeable, he says. The incentive to private investment would be tremendous, and tonnage of ore mined would be staggering.

A second incentive recommended by Mr. Dean is that the depletion allowance for uranium mining be increased from its present 15 per cent to 27 per cent—equal to the allowance for petroleum properties. Under the depletion allowance plan, miners are permitted to subtract for tax purposes a percentage of the gross value of ore mined and sold from earnings.

Investment Aid—AEC acted last week to help spur private investment in uranium mining ventures by relaxing mine information regulations. Most companies are now permitted to disclose their ore production and reserves. This aids mining companies in drawing up prospectuses for stock offerings. However, mining firms operating milling facilities on the Colorado Plateau are still limited in disclosing information for security reasons, AEC officials explain. Others may be restricted in the future if their reserves or production become large enough to substantially affect total supplies.

New Atomic Reactor Designed

Babcock & Wilcox Co., New York, states that its Atomic Energy Division has prepared a detailed design of a research atomic reactor and is willing to submit bids for manufacture and installation of the unit anywhere in the U. S.

The reactor is primarily for colleges and other atomic research organizations, officials say. But with government approval, it could be used to produce radioactive isotopes for industrial and medical use. Cost, the company claims, will be below any previous design of comparable reactor.

Reactor is the fluid fuel type and is expected to produce heat energy in excess of 100 kilowatts.

You can design light weight, longer life, and economy into your products by including N-A-X HIGH-TENSILE in your plans.

It is 50% stronger than mild steel.
It is considerably more resistant to corrosion.
It has greater paint adhesion with less undercoat corrosion.
It has high fatigue life with great toughness.
It has greater resistance to abrasion or wear.
It is readily and easily welded by any process.
It polishes to a high lustre at minimum cost.

And with all these physical advantages over mild carbon steel—it can be cold formed as readily into the most difficult shaped stamping.

Sound like something for you? Ask for full facts and think of N-A-X HIGH-TENSILE when you re-design.

GREAT LAKES STEEL CORPORATION

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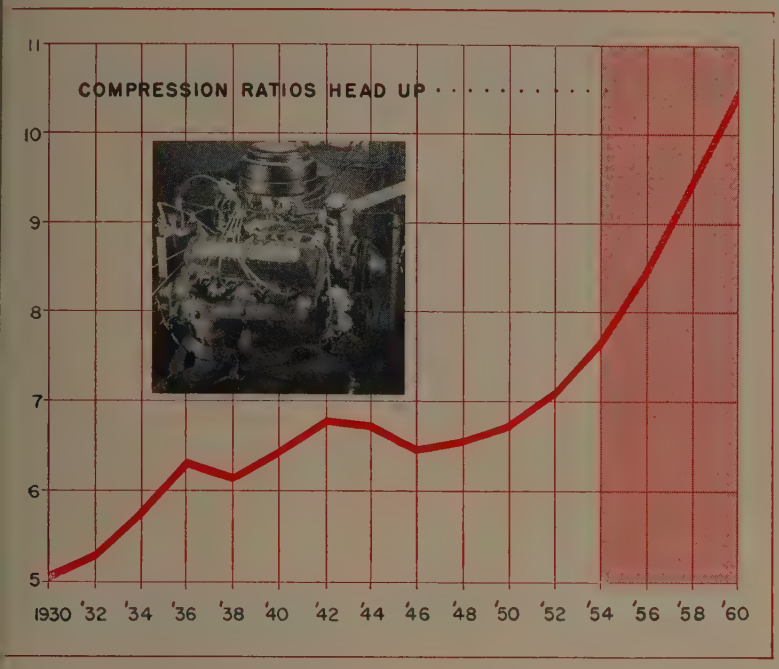
NATIONAL STEEL CORPORATION



Advances in Gasoline Technology Mean Big Changes Ahead in Autos

DETROIT

GASOLINES do so many odd jobs around the engine today that it's hard to remember they still earn their keep by burning. And it's harder yet to remember back to 1923 when the granddaddy of the "additives," tetraethyl lead, contributed to octane numbers.

There have, of course, been other contributors to the steady rise of octane over the years. Catalytic cracking, thermal reforming and hydroforming are just a few that came along in the 1930s. Now you'll be hearing about octane again later this year, probably like it was a brand new discovery.

Ratio Builder—The thing that is new is catalytic reforming, a process which first appeared in 1949. About 44 installations have thus far been completed to utilize the process and by the end of 1954 about 54 more will join them in production. When that happens, premium fuel will be produced at 97 octane contrasted with comparable grades of about 92.7 octane now. This new fuel will not inherently defrost float bowls, scrub spark plugs or polish the under side of the hood. But it will permit the automakers to do one highly significant thing—raise compression ratios.

As the chart indicates, raising compression ratios is nothing new. Compression ratios have been increasing almost steadily over the past quarter-century. Part of the increase has been due to increases in the octane number of the fuel. Another part of the increase is due to the so-called "mechanical octanes" which amounts to combustion chamber design permitting the highest possible compression ratio with the fuel available without knock. But the engineers have done about all they can with the fuels available, and they're mighty glad to have the new material coming to work with.

Background—The reason lies in the fact that for almost 75 years engineers have recognized that increasing compression ratios is the fundamental method of increasing engine efficiency. And efficiency, as the engineers define it, is the amount of work performed for the energy or gasoline expended. That means how many miles you get to the gallon, and the effect of compression ratios on mileage was strikingly demonstrated some time ago.

A 1915 Cadillac with a compression ratio of 4.25 cruising at 40 mph yielded 9.5 miles per gallon. A 1935 Cadillac with 6.25 compression ratio gave 13 miles per gallon at the same speed. A 1951 Cadillac with 7.5 compression ratio went 19.8 miles per gallon at 40 mph. But the real screamer was an experimental-engined 1951 Cadillac dubbed "19XX." With a compression ratio of 12 to 1, this car rolled off 27.6 miles per gallon at the 40 mph speed which sounds more like a Cushman than a Cadillac.

Practical Improvement—But the fuel used was 103 octane and, with the new fuel coming at only 97 octane, next year will not be "19XX." If compression ratios should be hiked to about 10 to 1, however, and if the higher compression ratio were used entirely to reduce gasoline consumption, an 8 to 1 job would show an increase in fuel economy of 12 per cent at the new level.

The compression ratio hike need not be directed to fuel economy, though. Improved fuel economy from higher compression ratio engines results from two factors. The first is the higher thermal efficiency which accompanies the higher ratio. The second is the higher power output which permits lower engine speed for a given road speed at the same acceleration performance level. That was the case with the "19XX", but if the engineers so decide, the power hike can be directed to the dig in and drag department in a manner

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Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,679	614,000
February		623,793
March		752,474
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		528,681
Total		7,830,746

Week Ended	1954	1953
Jan. 23	146,741	149,550
Jan. 30	143,654	150,289
Feb. 6	138,987	146,809
Feb. 13	142,097	147,103
Feb. 20	146,292	161,860
Feb. 27	148,000*	167,779

Source: Ward's Automotive Reports.
*Estimated by STEEL.

to make current models look somewhat like pedestrians.

Pro and Con—Although some observers feel that the bonanza will go to economy, others feel it will go to performance. The probable upshot of the situation will be increases both in performance and in economy as has been the traditional pattern in the past. But there does seem little doubt that economy will come in for greater attention, particularly if business begins to slow down and customers become dollar conscious.

But that's one of the lesser considerations for the engineers. As compression ratios go up, so do combustion pressures in the engine and, consequently, stresses. That means a new look at bearing surfaces and bearing materials, closer atttention to finish and tolerances.

Changes—It also means the end of the L-heads which can't provide breathing at high compression ratios. Six-cylinder inline engines of the OHV type have advantages of low initial cost, simplicity and compactness so that they are expected to continue. But in cases where they now lack them, seven main bearings will be required to handle high compression stresses.

Sitting prettiest, of course, are the new OHV V-8 units which in most cases were designed to handle compression ratios up to 10 to one and higher. Only one such engine introduced since the war is generally considered to be at or near its limit and probably can be modified without overly excessive cost.

Another Trend—Rear-end ratios will undoubtedly start down in the move to fuel economy. A car with 10 to 1 compression ratio and a rear-end ratio of only 3.5 to 1 will equal the performance of an 8 to 1 job with 3.6 to 1 rear end.

There are some who see a move to smaller engines as the power per cubic inch moves up, but most observers see engine size remaining the same or possibly even tending to increase. Larger bores provide room for bigger valves, bearings and cranks. And pistons traveling less distance means less friction and more efficiency. That's why the new Ford oversquare engine is looked upon as a trend setter.

U. S. Gains—Others point out that the small, high-winding European-type engine is rapidly being overtaken by its less-excitable American competition. The Jaguar with 3.5 litres displacement yields 45.5 horsepower per litre while the Cadillac with 5.2 litres yawning inside comes up with 44 horsepower per litre. The basic problem for passenger cars is that high rpm's increase friction loss and wear. One expert considers the point of diminishing returns to lie at about 400 rpm maximum.

As this column pointed out a few weeks ago, the gas turbine engine has plenty of development work ahead before it will be ready for passenger cars. In the meantime, the friendly old reciprocating torquers are not going to be standing still. And the coming hike in octane will open up a new vista for the men who toil among the spark plugs, offer a jab at the gas turbine's most vulnerable spot—fuel economy.

Ford Gets the Bug

Among a few of the things that make the Ford Thunderbird a real nifty are balljoint suspension, availability of standard shift as well as Fordomatic and the composition auxiliary hard top. Another important factor is the fact that the Ford counterpart of the Corvette comes complete with a 160-hp OHV V-8 engine which is probably about where the Chevvie job will be a year from now.

Incidentally, with the same horsepower as a Jag and only about 300 pounds more weight which could be pared, the car could give the competition-minded an interesting ride. The reported $5-million tooling bill for the steel-bodied job sounds like Ford means business when production starts next fall.

Exhaust Notes

On the subject of show cars, perhaps you noticed a similarity between the Buick Wildcat II, Oldsmobile F-88 and the production Chevrolet Corvette. The reason, according to our favorite GM spy, lies in the fact that from the cowl back they are Corvettes with identification changes in the fender sweep-back.

FORD THUNDERBIRD
. . . now tooling for fall production

DIE CAST OF ZINC

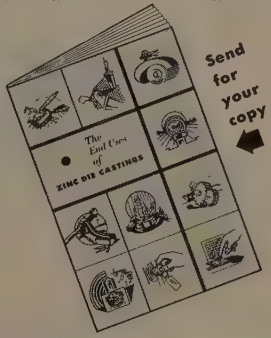
for PHILCO

Here's Why . . . .

Die casting is the only economically feasible means of production for this Philco TV receiver screen frame. And ZINC was the logical choice of metal to obtain the required physical characteristics at the lowest cost. The casting is shown here *as delivered to Philco* with the as-cast surfaces handsomely finished in two-tone durable enamel.

This front view of the ZINC Die Cast frame reveals the unusual contours, the engraved lettering and serrated decorative treatment, and the cored openings in the recessed control panel at the base—all obtained in the high speed casting operation! A rear view of the casting would reveal ingenious coring to insure maximum strength with a minimum amount of metal, plus cast bosses to facilitate assembly of the frame to the cabinet.

Add to the foregoing the dimensional accuracy of ZINC Die Castings and you have the principal reasons for the ever-increasing use of this metal and method of production. For many more examples of successful ZINC Die Casting applications in a wide range of products ask us—or any die casting company—for our booklet "The End Uses of the Zinc Die Castings".



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The Research was done, the Alloys were developed, and most Die Castings are based on

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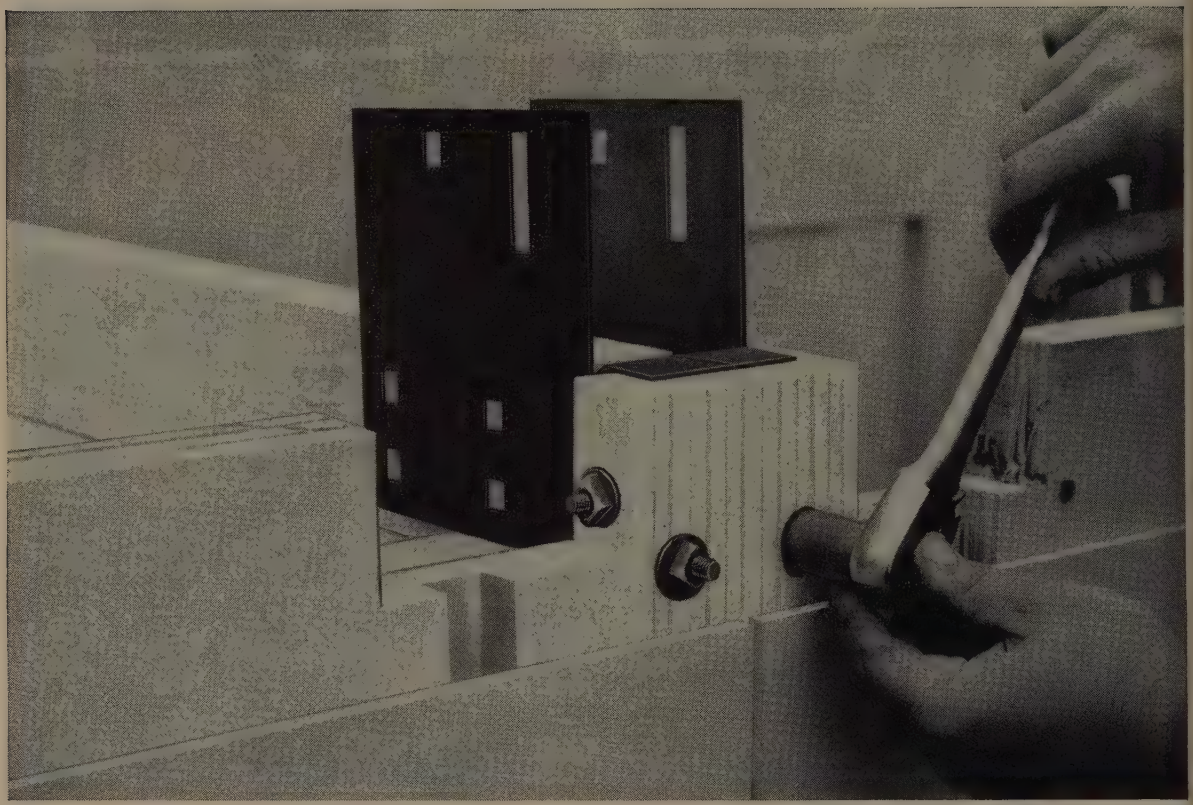


RAISING THE ROOF of a U.S. Steel home goes faster with help of RB&W bolts. Here workman is tightening bolt holding steel plate to exterior wall panel. Plate is then used as joint for bolting ceiling panels.

That's a house he's bolting together!

U.S. Steel Homes found that bolting together the panels of their fast-selling homes saves time and trouble. Nails are used only to hold panels temporarily in position for bolting and add no structural strength.

It's no accident, of course, that RB&W bolts and nuts were specified here. U.S. Steel Homes isn't the first to discover that the absolute uniformity and dependable holding power of RB&W products make them the best fasteners for any job. Workmen like the way RB&W nuts run on RB&W bolts fast and easy. And there's no question about the extra strength RB&W bolt-and-nut construction gives these homes.

Whenever you want to put something together *fast*, and make it stay fastened *for good*, give one of our men a ring. As a top-ranking maker of all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. You can count on fast delivery, too. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.

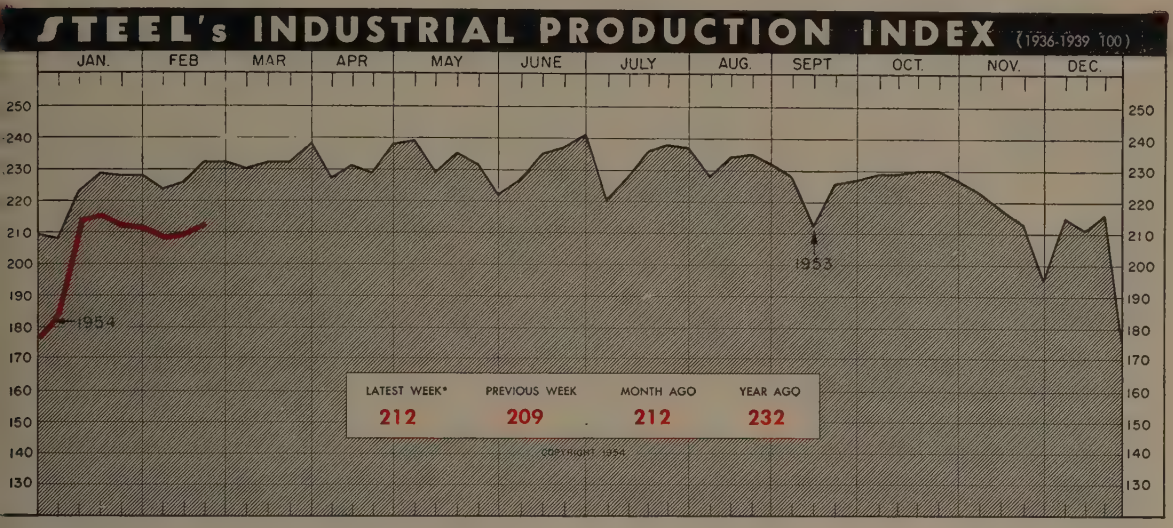
HOUSE GOING UP. U.S. Steel home nears completion as workmen on scaffold (right) bolt on exterior panels. These sturdy homes offer quality construction at budget price.

3.2

RB&W

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939 100)
JAN. FEB MAR APR MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
250 240 230 220 210 200 190 180 170 160 150 140 130
1954
1953
LATEST WEEK* PREVIOUS WEEK MONTH AGO YEAR AGO
212 209 212 232
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*Week ended Feb. 20

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Business Slide Tapers Off as Spring Approaches

MARCH is looked upon as the key to the trend that business will follow the rest of this year.

President Eisenhower's expression of last month does not mean that March will turn a key that solves the business decline, but rather that this month will be the proper gage for measuring the downswing.

March was chosen because of the spring it puts into business. A rise is customary at this time of year. Its selection also backs up the administration's belief that the business slide will be of short duration.

Output Slide Slowing? . . .

Production prelude to March was not encouraging. The Federal Reserve Board's seasonally adjusted industrial production index in January slipped 2 points from December to register 125 per cent of the 1947-1949 average. Outturn in the seventh consecutive month of decline was 9 points below the comparable month in 1953.

Speed of the output slide may be tapering off, however. The rise of STEEL's unadjusted industrial production index to a preliminary 212 per cent of the 1936-1939 average in the week ended Feb. 20 was a gain for the second consecutive week.

Signs of Spring Upturn . . .

Other buds of business pick-up are appearing. Robert F. Black, president, White Motor Co., reveals that his concern is replacing steel inventories for the first time since last October. Another company relates that its capital investment program must include replacement of machines that have been operated continuously for two turns since their purchase a decade ago.

Forward to Automation

Still another manufacturer, Otis Elevator Co. gives a side light on costs by pointing out that its new operatorless elevators accounted for some 80 per cent of sales last year. The trend to automation in the plant will give a marked boost to sales of electrical controls equipment this year. Similar forces in the office last year enabled International Business Machines Corp. not only to produce more products than ever before but to end the year with a record level of unfilled orders.

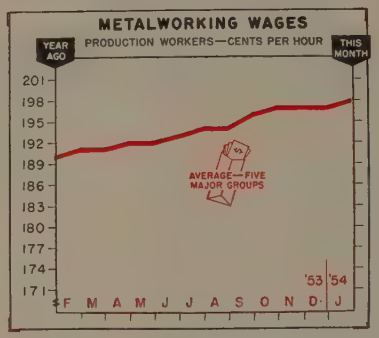
Retail Sales, Credit Down . . .

While industrial production may rise, due to seasonal factors, it will be difficult for retail sales to measure up to last year's peak first half. That's indicated by the reduced demand for installment credit and the slight increase in sales of soft goods. The former, a year ago, was responsible for the crest attained in hard goods volume; the latter, though expected to rise this year over last, has not gained as much as was anticipated.

It's gratifying, however, that the part of retail volume represented by department store sales has held up so well. Measured by the four weeks ended Feb. 13, these sales were still only 1 per cent below the same period a year ago, the Federal Reserve Board says.

Retail Failures Rise . . .

Present dip in retail sales added the names of many retail outlets to the January business failure list. All of the increase in mor-



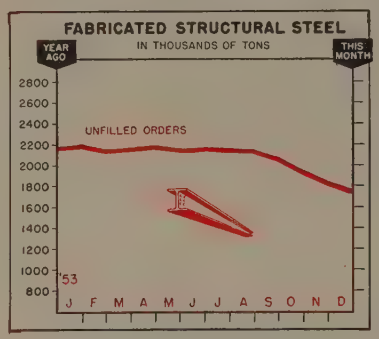
Metalworking Wages

(cents per hour)

Production Workers—Five Major Groups

	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
1953					
Jan.	203	181	193	172	203
Feb.	201	182	194	173	205
Mar.	201	183	195	173	205
Apr.	201	183	195	174	206
May	202	183	195	174	205
June	205	184	195	175	207
July	209	185	195	176	207
Aug.	208	185	196	177	206
Sept.	212	186	198	178	207
Oct.	208	187	199	177	209
Nov.	208	188	199	178	210
Dec.	207	188	200	179	211
1954					
Jan.	207	188	200	180	214

U. S. Bureau of Labor Statistics.

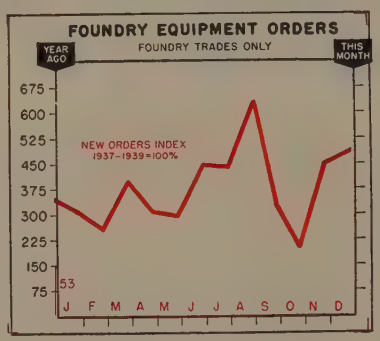


Fabricated Structural Steel

Thousands of Net Tons

	Shipments 1953	Shipments 1952	Backlogs 1953	Backlogs 1952
Jan.	241.4	244.9	2,180	2,416
Feb.	251.1	246.4	2,128	2,408
Mar.	266.3	268.8	2,155	2,501
Apr.	263.2	230.7	2,168	2,350
May	263.8	244.2	2,179	2,263
June	274.6	125.5	2,153	2,261
July	230.3	138.3	2,134	2,361
Aug.	251.1	226.3	2,122	2,363
Sept.	255.6	227.6	2,041	2,342
Oct.	295.5	261.7	1,927	2,266
Nov.	257.8	222.6	1,804	2,357
Dec.	266.9	225.2	1,741	2,153
Total	....	2,664.3		

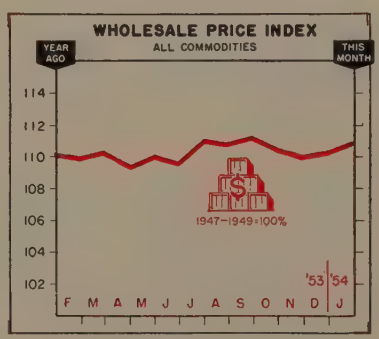
American Institute of Steel Construction.



Foundry Equipment Orders

	Index (1935-1939=100) 1953	Index (1935-1939=100) 1952	Value Thousands 1953	Value Thousands 1952
Jan.	301.0	404.5	$1,379	$1,862
Feb.	207.3	200.4	1,179	922
Mar.	396.7	310.0	1,818	1,427
Apr.	303.0	385.1	1,305	1,773
May	294.4	225.2	1,568	1,037
June	446.8	353.8	2,998	1,629
July	440.8	243.9	2,362	1,583
Aug.	633.3	311.6	3,615	1,434
Sept.	317.2	365.9	1,575	1,685
Oct.	202.9	335.8	1,099	1,538
Nov.	455.8	258.1	2,190	1,183
Dec.	494.3	343.3	2,302	1,573

Foundry Equipment Mfrs. Assn.



Wholesale Price Index

(1947-1949=100)

	1954	1953	1952
Jan.	110.8	109.9	113.0
Feb.	....	109.6	112.6
Mar.	....	110.0	112.3
Apr.	....	109.4	111.8
May	....	109.8	111.6
June	....	109.5	111.3
July	....	110.9	111.8
Aug.	....	110.6	112.2
Sept.	....	111.0	111.7
Oct.	....	110.2	111.1
Nov.	....	109.8	110.7
Dec.	....	110.1	109.6

U. S. Bureau of Labor Statistics.

Charts Copyright 1954 STEEL.

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Feb. 22	Indus. Production..Feb. 15	Ranges, Gas .....Jan. 11
Durable Goods ...Dec. 14	Ironers .....Feb. 15	Refrigerators .....Jan. 8
Employ., Metalwk..Feb. 22	Machine Tools ....Jan. 8	Steel Castings ....Jan. 18
Employ., Steel ....Feb. 1	Malleable Castings.Jan. 18	Steel Forgings ....Feb. 1
Freight Cars .....Feb. 22	Prices, Consumer ..Dec. 7	Steel Shipments ..Jan. 11
Furnaces, Indus. ..Jan. 8	Pumps .....Nov. 16	Vacuum Cleaners...Jan. 11
Gears .....Feb. 15	Radio, TV .....Feb. 22	Washers .....Feb. 15
Gray Iron Castings.Jan. 18	Ranges, Elec. .....Jan. 8	Water Heaters ....Jan. 11

tality between December and January was concentrated in retail trade where the toll climbed to the highest level since mid-1942, Dun & Bradstreet reveals.

Increase in retail failures boosted the total of failures to 867 in January, the highest toll for any month since 1950 and the highest total for a first month in the last 12 years. Even in relation to each 10,000 businesses now in operation the annual rate of failure was 37, 11 more than the annual rate for the comparable month a year ago.

Trend toward failures appears to be casting a fast rising specter. Laid low by competition and other factors in the week ended Feb. 11 were 277 commercial and industrial casualties. This was the highest number since May, 1941, and the toll was only 13 per cent under that registered for the similar week in 1939.

Pay Claims Slide . . .

Although the rise in retail casualties adds to the number of new claims for jobless pay, nationally the number of new obligations has followed the declining pattern noticed earlier in Cleveland (see STEEL, Feb. 15, p. 87). While new claims for unemployment compensation totaled 364,000 in the week ended Feb. 6, the number of new obligations slid for the fourth consecutive week, the Department of Labor reports.

Money Creates Money . . .

Businessmen seem to be acting more optimistically in their dealings with banks. Although businessmen have been making rapid payments on the loans and the total amount of these borrowings is $22,556,000,000, $401 million below a year ago, the rate of decline appears to be slowing. Also, Federal Reserve Bank figures indicate that some makers of metals and metal products and some other manufacturers of durable goods are in the market for funds.

Car Sales Improve . . .

Sales of both new and used cars are improving. Dealers handling both showed a further dip in used car stocks on Feb. 10, according to *Ward's Automotive Reports.*

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,772	1,774	2,235
Electric Power Distributed (million kwhr)	8,730[1]	8,684	8,196
Bitum. Coal Output (daily av.—1000 tons)	1,267	1,306	1,392
Petroleum Production (daily av.—1000 bbls)	6,350[1]	6,322	6,543
Construction Volume (ENR—millions)	$149.7	$196.9	$267.8
Automobile, Truck Output (Ward's—units)	146,292	142,097	161,860
TRADE			
Freight Car Loadings (unit—1000 cars)	626[1]	624	690
Business Failures (Dun & Bradstreet, no.)	250[1]	277	176
Currency in Circulation (millions)[3]	$29,821	$29,923	$29,654
Dept. Store Sales (changes from year ago)[3]	−1%	−2%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,528	$17,832	$17,520
Federal Gross Debt (billions)	$274.7	$274.8	$267.4
Bond Volume, NYSE (millions)	$18.9	$21.7	$16.6
Stocks Sales, NYSE (thousands of shares)	8,712	9,441	6,630
Loans and Investments (billions)[4]	$79.9	$80.7	$76.9
U. S. Gov't Obligations Held (billions)[4]	$32.4	$33.0	$31.3
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	201.3	203.2	210.7
All Commodities[7]	110.5	110.5	109.6
Commodities Other Than Farm & Foods[7]	114.3	114.4	113.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

Previously, on Jan. 31, used car stocks were 4 per cent below the Nov. 30, 1953, all-time high. Also, sales of new cars in the first ten days of February showed some firmness by equaling the previous month's best 10-day period.

A Look at the Railroads . . .

Loading of railroad revenue freight, now in the seventh consecutive week of decline, is also improving. The betterment is the one anticipated—a tapering off of the decline from year ago levels.

Though makers of locomotives for the nation's Class I railroads have cut the number of unfilled orders by about 50 per cent during the past two years, they still had a backlog of 486 new locomotive units on February 1, figures of the Association of American Railroads reveal.

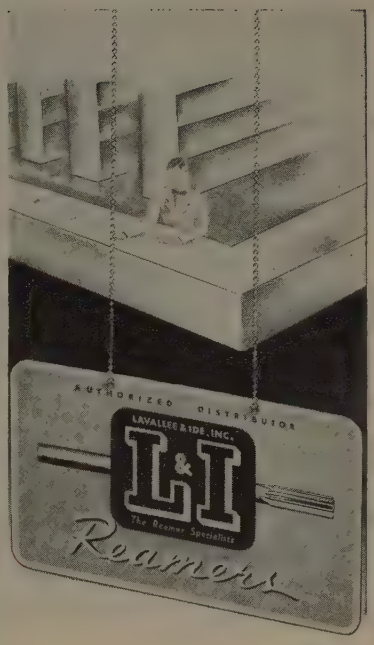
In a more favored position railroadwise is the Budd Co. E. G. Budd Jr., president, recently said that the concern's backlog of 258 railroad passenger cars would be sufficient to keep assembly lines busy until the middle of next year.

Coal Price Slides . . .

Greater supply than demand for bituminous coal has finally resulted in a major price cut, the first one since Apr. 1, 1953. West Virginia steam coal shipped to East Coast utilities has been reduced 25 cents a ton. Central Pennsylvania producers are expected to follow this action with their prices. Meanwhile, downgrading of coal, the shipping of premium grades at a price usually charged for slack, will continue.

Gasoline Refining Hiked . . .

The petroleum industry presents a picture of excessive refining which may lead into excessive production on one hand and gasoline price cuts on the other. During the week ended Feb. 13, refinery runs averaged 7,030,000 barrels daily, 151,000 more barrels daily than the preceding week and 13,000 barrels a day above a year ago, the American Petroleum Institute says. This amount of refining pushed gasoline stocks to a record 176,000,000 barrels, more than 21,000,000 barrels above the comparable time last year. Refining of crude at this level also brought gasoline price cuts close again—overproduction in the fourth quarter of 1952 brought the last price cuts. Unlike the situation then, however, a production increase in crude oil rather than a decrease is sought.



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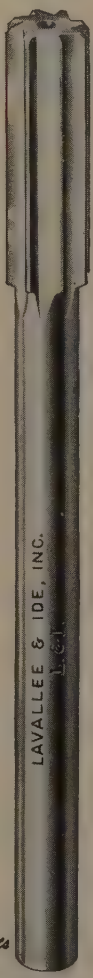

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Users report cleaner rolls, reduced spalling, and absence of gumming. The result is lower power consumption and higher mill speeds—as much as 50% in many cases. In the annealing operations, Sunoco Emulsifying Rolling Oil burns off cleanly—usually making cleaning unnecessary. All of these advantages contribute to lower cost operation.

You can also use Sunoco Emulsifying Rolling Oil advantageously for rust proofing hot rolled sheets after pickling, and as a die lubricant in cold drawing steel bars.

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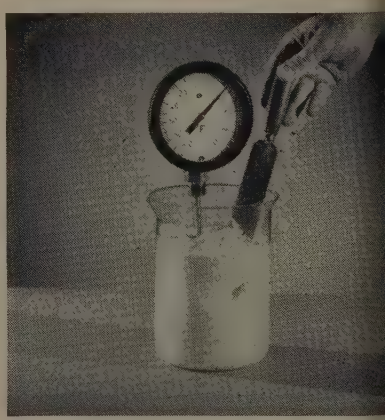
HARD WATER—Tested in dozens of samples of water obtained from industrial plants having hard water problems. Never failed to form a stable emulsion.



COLD WATER—Forms a stable emulsion in the coldest water . . . even ice water.

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Made by the refiners of famous Blue Sunoco Gasoline and Dynalube Motor Oils

WILLIAM T. FOGARTY
. . . Detroit Diesel Engine Div. p. a.

W. B. DUNCAN
. . . Wesson Co.'s chairman of the board

WILLIAM D. BELL
. . . heads Boston Gear Works dept.

William T. Fogarty was named purchasing agent of **Detroit Diesel Engine Division,** General Motors Corp., Detroit, which he joined in 1951 as an assistant purchasing agent.

Herbert E. Brumder, general manager, was elected president and treasurer, **Downington Iron Works Inc.,** Downington, Pa., division of Pressed Steel Tank Co. Before joining Downington in 1952, Mr. Brumder was chief engineer at Pressed Steel Tank in Milwaukee. Former president of Downington Iron Works, **Penrose M. Davis,** and former treasurer **Park L. Plank** have retired. **N. A. Evans** was elected vice president, **J. R. Piersol** assistant secretary and **T. G. Ashworth** assistant treasurer.

At **Geo. Worthington Co.,** Cleveland, **John W. Vickers,** manager of the industrial sales division, was elected vice president and member of the executive committee. **W. D. Campbell,** sales manager, was elected to membership on the board of directors.

Effective Apr. 1, **F. J. Heaslip** will retire from **Fairbanks, Morse & Co.,** Chicago, where he serves as vice president in charge of purchases and traffic. It was recently announced that **Donald L. Harwood** was made general purchasing agent.

Wesson Co., Detroit, elected **W. B. Duncan** chairman of the board and **E. Mortensen** president. Mr. Duncan, president since 1941, assumes the chairmanship formerly held by the late **Frank W. Archer Jr.** Mr. Mortensen has been serving as vice president in charge of manufacturing.

Paul R. Nichols was promoted to assistant general superintendent, **Wisconsin Steel Works,** International Harvester Co., Chicago, to succeed the late **F. M. Washburn. John R. Pigott** replaces Mr. Nichols as second assistant general superintendent.

American Safety Razor Corp., New York, appointed **David M. Nason** purchasing agent. He was formerly with Piasecki Helicopter Corp.

Malcolm D. Salinger was appointed chief engineer, **Cleveland Frog & Crossing Co.,** Cleveland. **Charles M. Cowles** was made assistant chief engineer and **John A. Rode** chief estimator.

Lake Erie Engineering Corp., Buffalo, appointed **Ephriam M. Detwiler** general superintendent.

Frank E. Smith, formerly with Vesuvius Crucible Co., is now associated with **Exothermic Alloys Sales & Service Inc.,** Bridgeville, Pa., as sales engineer representative in the East Coast area.

William D. Bell was appointed manager of special products at **Boston Gear Works,** Quincy, Mass. He will head a recently established separate department, handling special nonstandard gears.

William E. Hill and **Benno M. Bechhold** of New York, and **Robert A. Weaver Jr.** of Watertown, Mass., are new directors of **Worcester Pressed Steel Co.,** Worcester, Mass.

Blocked Iron Corp., Albany, N. Y., elected **William E. Richey** chairman of the board and treasurer, **Louis G. Imperato** president and **John A. Stephens** vice president-secretary. **Joseph J. Thomas,** former assistant general sales manager at North American Refractories Co., joined Blocked Iron as manager of sales. **Charles R. Amberg** is director of research in charge of the firm's Montrose, N. Y., laboratory.

Arthur B. Glover was appointed superintendent and **Milton D. Robinson** assistant superintendent of the electrical division of **Acme Steel Co.'s** Riverdale, Ill., plant. Mr. Glover replaces **John H. Wagner** who recently retired after 35 years with Acme Steel.

Bell & Gossett Co., Morton Grove, Ill., elected **R. E. Moore** and **Clarence E. Pullum** executive vice presidents. **E. J. Gossett,** pres-

LOREN C. WHEELER
. . . Atkomatic Valve sales manager

THOMAS H. PATTISON
. . . Mackintosh-Hemphill plant supt.

JOSEPH K. SALOMON
. . . heads Royal Metal Mfg. Co.

ident, was also named chairman of the board. Messrs. Moore and Pullum continue as secretary and treasurer, respectively.

Loren C. Wheeler was made sales manager of **Atkomatic Valve Co.**, Indianapolis. He was formerly assistant sales manager.

Roylyn Inc., Glendale, Calif., named **Dave Lasher** production planning manager, **John Hawkinson** sales co-ordinator and price specialist and **A. Preston Fetty** sales engineer.

G. B. D. Peterson was named co-manager with **C. M. Whelan** of the Detroit district sales office of **Aluminum Co. of America.** Named to succeed Mr. Peterson as New York export sales manager is **John W. Wilson.**

Walter M. Harks was named a vice president and director of sales for **Bowser Inc.**, Chicago. He was general sales manager of the Ft. Wayne, Ind., division. **Allan J. Tremper** was named administrator for the company's north central region with headquarters in Chicago.

Thomas H. Pattison was appointed superintendent of operations at the Garrison plant of **Mackintosh-Hemphill Co.**, Pittsburgh. He has been plant metallurgist since 1937 and is succeeded by **John B. McGlade. Charles W. Barker** was made assistant plant metallurgist. **Oliver B. Douthett** is the new general foreman, foundry operations, and **I. Robert Jones** general foreman, fabricating operations.

Link-Belt Co. appointed **John D. Riley** district manager of its Cleveland office and **Harry G. Andersen** of its Newark, N. J., office. Mr. Riley succeeds the late **Paul Wheeler.**

G. Russell Tatum was named general manager of **Vitro Laboratories,** a division of Vitro Corp. of America, New York.

Joseph K. Salomon, since 1948 general manager and secretary, **Royal Metal Mfg. Co.**, Chicago, was named president to succeed the late **Hobart A. Green. George C. Lautemann** was named executive vice president and **George H. Lowell** secretary-treasurer. Mr. Lautemann is president of the Canadian subsidiary, Royal Metal Mfg. Co. Ltd., Galt, Ont., and retains that position. His headquarters will be at Chicago.

Frank M. Mansfield III, former Detroit district engineer for Torrington Mfg. Co., joined **Carboloy Department,** General Electric Co., Detroit, as manager of product programming.

Motorola Communications & Electronics Inc., Chicago, appointed **Harold A. Jones** executive assistant to the national sales manager, **Lloyd P. Morris** to chief engineer of a new Motorola service, the national radio systems consulting service, and **Henry Magnuski** associate director of research.

Earl A. Lerner, formerly western mines representative for Pioneer Engineering Works Inc., was appointed sales manager, **Kensington Steel Co.**, Chicago. Both companies are subsidiaries of Poor & Co. Mr. Lerner succeeds **H. Monteith Albers,** recently elected vice president of Kensington Steel.

Robertshaw-Fulton Controls Co., Greensburg, Pa., appointed **Joseph C. McCarthy** of Toronto as Canadian sales representative for its Robertshaw Thermostat, American Thermostat and Grayson Divisions.

W. C. Windsor was elected to the board of directors of **Lone Star Steel Co.**, Lone Star, Tex. He replaces the late **Joseph M. Haddad.**

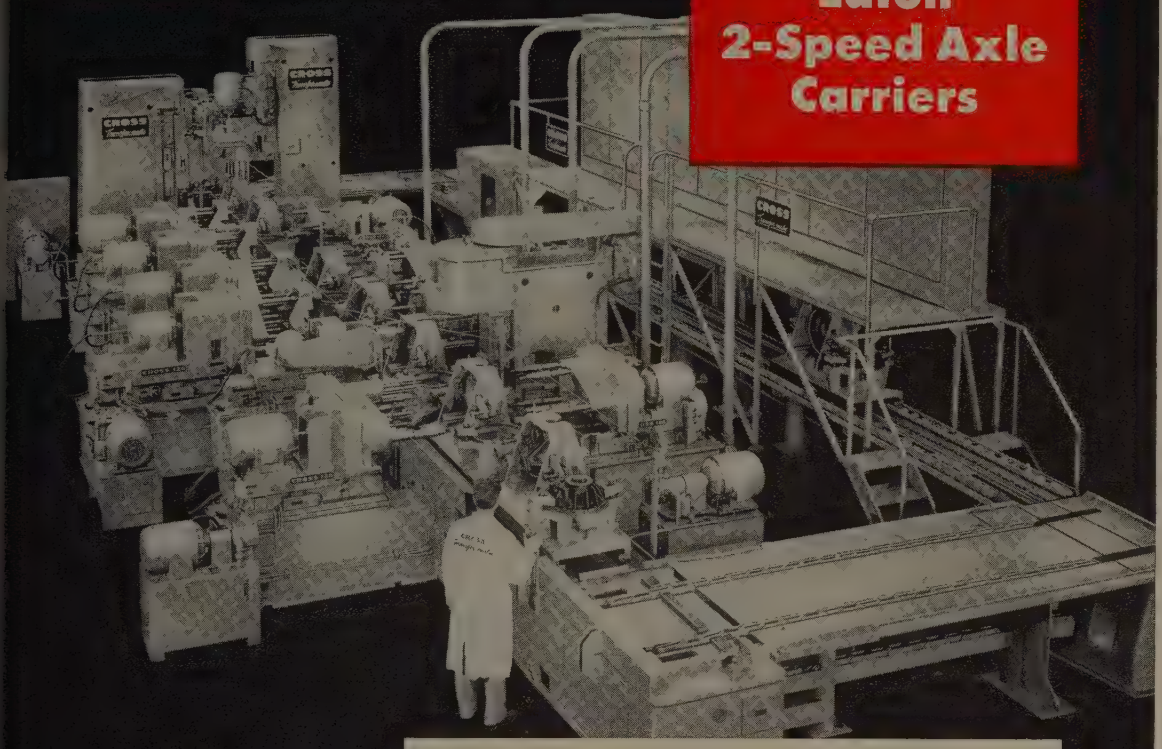
Robert Fulton joined **Easton Metal Powder Co.**, Easton, Pa., to assist in the sale and promotion of its RZ iron powder. He was formerly assistant to the president of Charles Hardy Inc.

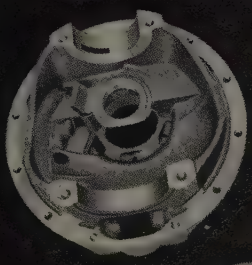
Donald G. Clark was elected a director of **Firth Sterling Inc.**, Pittsburgh. He was a vice president and a director from 1928 to 1945 when he retired. For the last few years he has served in a consulting capacity.

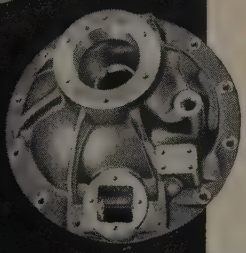
Pittsburgh Steel Co., Pittsburgh, promoted **George N. Jarvis** plant engineer at its Monessen, Pa., Works. **Frank Paterra** was made general foreman, sheet shipping department, and **Robert T. Githens**

Another Transfer-matic by Cross

Mills, Drills and Taps Eaton 2-Speed Axle Carriers







★ 53 parts per hour at 100% efficiency—capacity for spiral bevel or hypoid style carriers.

★ 97 operations: 60 drilling, chamfering and reaming; 5 milling; 4 spotfacing and counterboring; 28 tapping.

★ 9 stations: 1 loading, 1 unloading, 7 machining.

★ Two-position, progressive type work holding fixtures with automatic transfer from station to station and integral conveyor for automatic return from unloading to loading station.

★ Cleaning unit for removing chips from fixtures between unloading and loading station.

★ Other features: Complete interchangeability of all standard and special parts for easy maintenance; construction to J.I.C. standards; hardened and ground ways; hydraulic feed and rapid traverse; individual lead screw feed for tapping; coolant system; automatic lubrication.

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DETROIT 7, MICHIGAN

Special MACHINE TOOLS

supervisor, sheet mill accounting clerks.

Raymond D. Baker, general manager of Remington Rand Inc.'s manufacturing operations in Ilion, N. Y., was appointed assistant to B. F. Anderson, vice president in charge of production. **Lawrence A. Girard** was made general manager of the Ilion plants.

Raymond W. Hermanson joined **Merit Mfg. Co.,** Culver City, Calif., as director of sales and advertising. He formerly served as general sales manager for Tubing Appliance Co.

Herschel V. Hiatt, former assistant chief engineer for General Motors Corp.'s Allison Division, was named director of engineering for the Milwaukee division of **Le Roi Co.,** a subsidiary of Westinghouse Air Brake Co.

Paul M. Johnson will serve **General Refractories Co.,** Philadelphia, as sales engineer. **Nelson W. Bowman,** district sales manager in New York, moves to the main office in Philadelphia. **E. E. Christopher** heads the New York sales office.

J. R. Post was made assistant to the general superintendent at **U. S. Steel Corp.'s** Homestead District Works, Homestead, Pa. He is succeeded as superintendent of production planning by **Robert W. Fichtel,** assistant plant industrial engineer since 1952.

SWAN E. BERGSTROM

E. D. VANCIL

. . . promoted to new duties at Cincinnati Milling Machine

Cincinnati Milling Machine Co., Cincinnati, has added a machine tool division and named **Swan E. Bergstrom** manager. Vice president and director of the company, Mr. Bergstrom's responsibilities as head of this new division include engineering, manufacturing and selling. His assistant will be **L. F. Nenninger,** former works manager. In the company's machinery division **E. D. Vancil** was moved from manager of engineering to full management of the division. **D. M. Strauchen,** former manager, is on extended service as consultant. Included in the newly formed machine tool division is a new special machine tool division. **Carl Stugard** is manager and **Ed Rivoira** is manager, special machine tool engineering. **Al Dall** becomes manager of standard machine tool engineering and development.

Kenneth M. Halverson was made purchasing agent of **Ford Motor Co.'s** Ford Division assembly plant at Atlanta. **Charles C. Walker** succeeds Mr. Halverson as plant administrative assistant. Mr. Halverson replaces **Karl G. Johnson,** transferred to an engineer's position in the manufacturing standards department at the Atlanta assembly plant.

H. R. Powers was named general manager of **Koehring Co. of California,** Stockton, Calif., subsidiary of Koehring Co., Milwaukee. He previously served as domestic sales manager of LeTourneau-Westinghouse Co.

Robert A. Hughes was made sales manager of **Willamette Iron & Steel Co.,** Portland, Oreg. He has been equipment sales manager of Guy F. Atkinson Co. for the last five years.

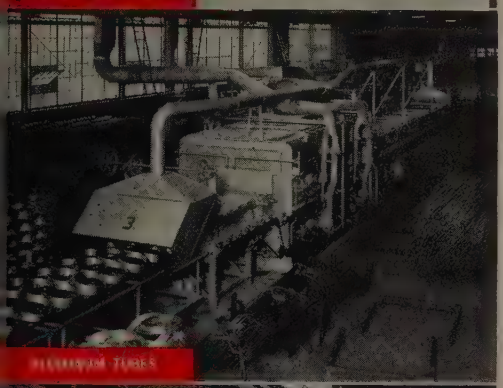
Walter J. Bloom was elected a director and also vice president in charge of sales, **Betmur Steel Corp.,** Detroit. He was formerly assistant manager of the Detroit district sales office of Weirton Steel Co.

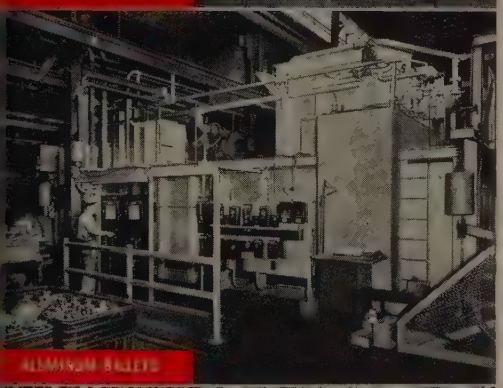
Vernon A. Peters was elected vice president, **Hancock Steel Co. Inc.,**

J. R. POST

ROBERT W. FICHTEL

. . . . appointments at U. S. Steel's Homestead District Works





costs trimmed
quality assured

in tailor-made furnaces for non-ferrous metals

Whatever non-ferrous metals you heat treat—in whatever size or shape—'Surface' engineers can tailor furnaces to fit your production needs. Some of the many custom-built 'Surface' furnaces are shown here—others have been used for slab heating, annealing, stress relieving, solution heat treating, ageing, forging, homogenizing, precipitation hardening.

'Surface' furnace engineering is based on years of practical experience, intensive research in metallurgical heating methods, and an almost unlimited variety of furnace and conveyor equipment. 'Surface' engineers have worked with the processors of copper, aluminum, and magnesium alloys as well as precious metals; giving them the "right cut" in costs, increased production, improved quality.
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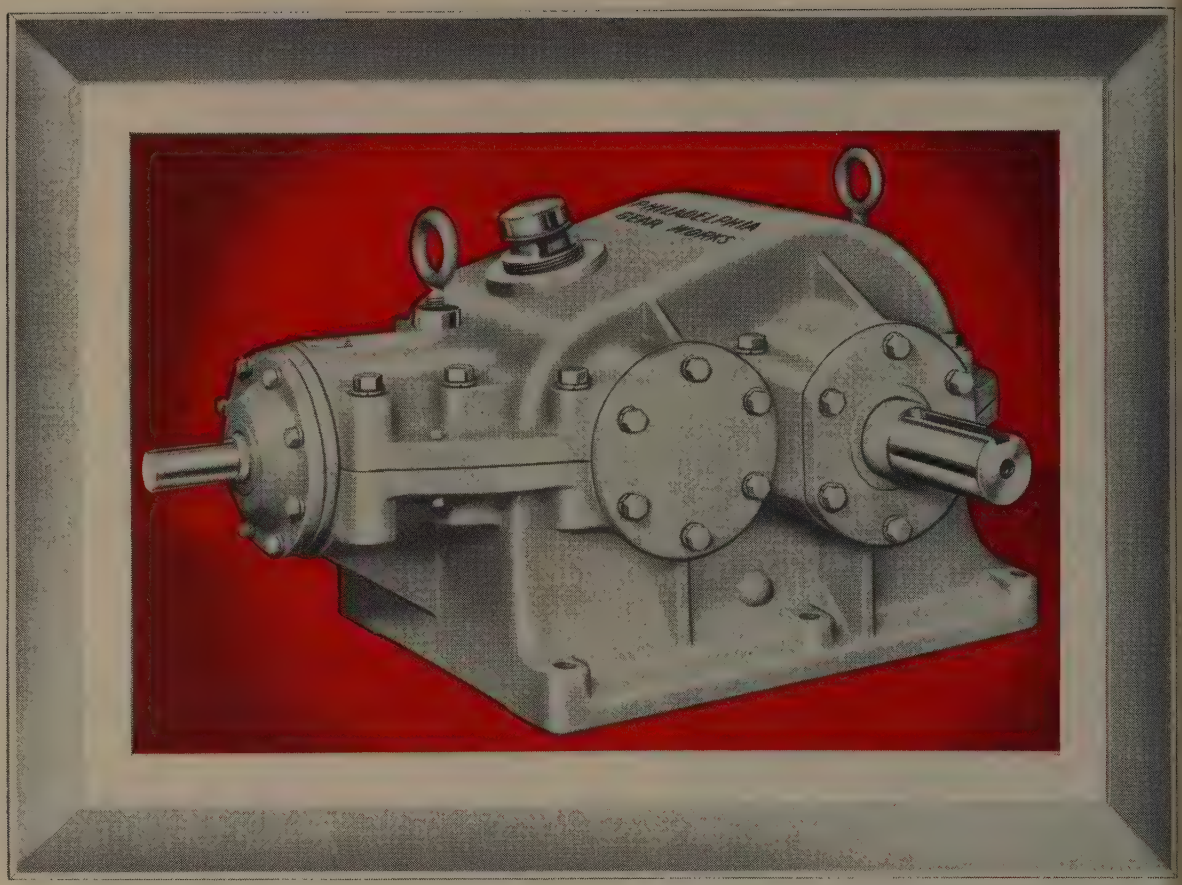
ALSO MAKERS OF
Kathabar HUMIDITY CONDITIONING Janitrol AUTOMATIC SPACE HEATING



Portrait of a Darned Good Right Angle Reducer by Phillie Gear

There are many qualities of design and construction which are not apparent from a "portrait" of a Philadelphia Spiral Bevel Reducer . . . for instance: High Speed Gearing consists of precision generated spiral bevel gears which are hardened, lapped, and ground, so that tooth contact is exactly right for many years of durable and quiet operation. The low speed or output gearing is hobbed and finally shaved to provide absolutely correct tooth dimensions and a fine surface finish. Here again, long and quiet gear life is engineered into Philadelphia Speed Reducers.

Housings are amply proportioned for rugged strength, heat radiation, and symmetrical gear arrangement. Bearings and shafting in every case are designed for overloads of at least 100%.

Philadelphia Spiral Bevel Reducers are available in a standardized line of housing sizes and gear ratios; however, every unit is "custom built" to your requirements and specifications. Changes from our standard line are gladly and economically made to suit your particular mounting and shafting arrangements.

Both horizontal and vertical types are available in single, double, triple reductions, with standard ratios ranging from 1:1 up to 238:1. Operating efficiencies run as high as 98%.

Where smooth, reliable, and continuous power transmission is required—a Philadelphia Spiral Bevel Reducer will do the job better and more economically.

For detailed information, write for catalog SB-50.

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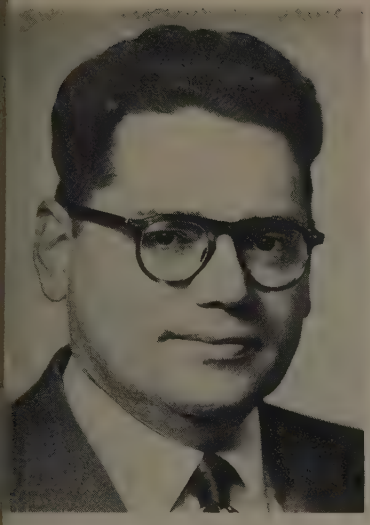
Industrial Gears & Speed Reducers

LimiTorque Valve Controls



D. A. MacRITCHIE
. . . Artisan Metal Works sales mgr.

ALFRED J. PORTER
. . . Heppenstall vice president

Detroit. He had been sales manager.

Artisan Metal Works Co., Cleveland, appointed **D. A. MacRitchie** sales manager. He served Flameco Corp. in a similar capacity.

Charles J. Gendreau, retired, is replaced as general superintendent of **General Railway Signal Co.,** Rochester, N. Y., by **James P. Cooper. Edward Drojarski** succeeds the late **Emerson P. Crane** as manager of commercial tests and inspections.

Marquardt Aircraft Co., Los Angeles, named **Don L. Walter** vice president-finance and **William H. Schwebel** vice president-operations.

Robert E. Schroeder was appointed assistant district manager, Cleveland district office, **Luria Bros. & Co. Inc.**

Robert R. Teller, formerly of Ford Motor Co., was appointed manager of the Detroit office of **Davis & Thompson Co.**

J. T. Morris, retired U. S. Air Force brigadier general, was named assistant vice president of **United Aircraft Products Inc.,** Dayton, O.

Alfred J. Porter, manager of the Bridgeport, Conn., plant of **Heppenstall Co.,** was elected a vice president of that Pittsburgh company.

Nash Motors Division, Nash-Kelvinator Corp., Detroit, appointed **James W. Watson** general sales manager. He was formerly eastern division sales manager.

Virginia Metal Products Inc., Orange, Va., appointed **H. B. Speasmaker** manager of production planning, **Karl Miller** manager of sales engineering.

C. L. Kenny was made manager of products, **Quaker Rubber Corp.,** Philadelphia, division of H. K. Porter Co. Inc.

James F. Chapman was made development engineer on special projects of the intercity bus division of **Flxible Co.,** Loudonville, O. He formerly was chief experimental engineer of ACF-Brill Motors Co.

New officers of **Hevi Duty Electric Co.,** Milwaukee, include: **E. E. Staples,** executive vice president and a director; **N. C. Bloye,** vice president in charge of the furnace division and assistant treasurer; **L. B. Lattin,** vice president in charge of the regulator division; **R. H. Sommers,** vice president in charge of the transformer division; and **C. E. Meyer,** works manager.

James W. Smith is now warehouse superintendent, Los Angeles district, **United States Steel Corp.** He succeeds **Edward W. Morley,** retired.

Robert G. Heers was appointed mining and raw materials manager, Fontana, Calif., Works, **Kaiser Steel Corp.**

Alfred J. Barchi is sales engineer in the Philadelphia sales office of **Alvey Conveyor Mfg. Co.**

Wilbur E. Combs was made assistant manager of sales development in the mechanical goods division of **United States Rubber Co.,** New York.

Paul L. Paulsen was named area order specialist in the Los Angeles office of **United States Steel Corp. Harold W. Scott** becomes store manager.

Hunley A. Slaughter of Craig Sales & Engineering Co., Memphis, Tenn., was appointed district manager in Tennessee and Arkansas by **American Flexible Coupling Co.,** Erie, Pa.

Austin F. Leach was made manager of product service for **General Electric Co.'s** welding department, York, Pa.

W. C. Stanley was made district manager of **Neilsen Pump Works,** Oil Well Supply Division of U. S. Steel Corp. He has headquarters at Long Beach, Calif.

Charles F. Johnson, assistant secretary and city sales manager for **Kropp Forge Co.,** Chicago, retired after 32 years with the firm.

H. K. Porter Co. Inc.'s Buffalo Steel Division, Tonawanda, N. Y., appointed **C. A. Suchan Jr.** New York district manager.

OBITUARIES...

George W. Shaffer, 46, plant and field superintendent, **S. P. Kinney Engineers Inc.,** Carnegie, Pa., died recently.

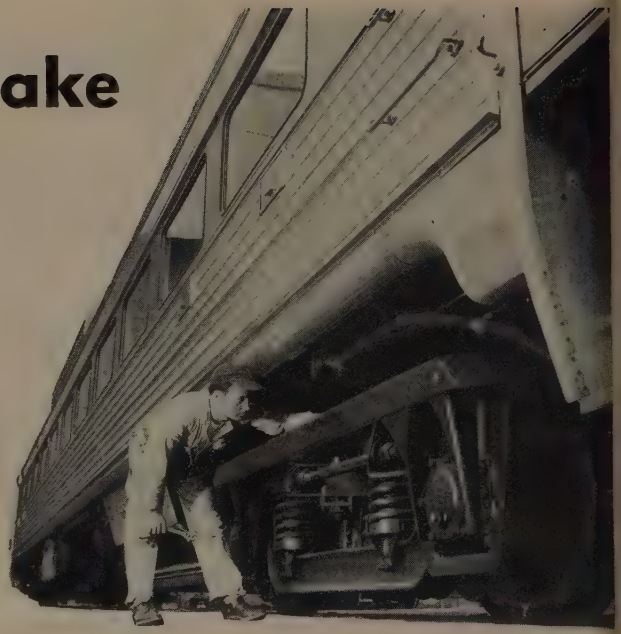
Allan H. Butz, 51, vice president, International Division, **Minnesota Mining & Mfg. Co.,** St. Paul, died Feb. 15.

Charles E. Stenson, 66, retired president, **Youngstown Steel Tank Co.,** Youngstown, died Feb. 12.

Walter A. Williston, 74, president, **Williston Steel Co.,** Torrington, Conn., died Feb. 16.

Budd Builds a Brake

BUILDING THE BUMP, jerk and grind out of railroad passenger car brakes is the thankful task of the Budd Co., Philadelphia. Budd accomplishes this humanitarian work with an unconventional brake that acts on cast-iron disks mounted inboard from the wheels on the axles. Brake shoes and air cylinders are mounted on a frame of Pittsburgh Steel Co.'s MT 1015 cold-drawn seamless tubing. The frame is suspended from the underside of the truck on a central bearing arm, while the outer ends of the frame ride on the journal boxes. Thus the frame mirrors axle movements, keeping the brake shoes always in line with the brake discs.



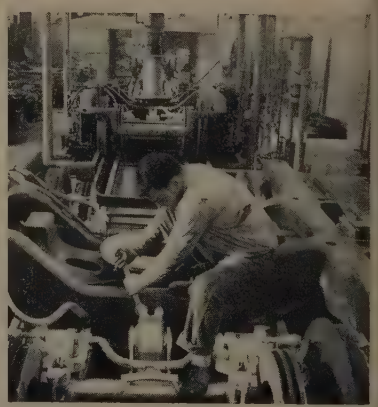
Pittsburgh Steel cold-drawn seamless tubing is cut to length as first step in manufacture of Budd disc brakes

Parts of brake assembly are firmly arc welded in this jig. Welder is working on hangar and hangar tube

Stresses in welds where brake shoe support arms join brake frame tube are relieved by gas flame heating

Air cylinders, brake shoes and other components are assembled to the brake frame on this production line

Brake assembly gets rigid final inspection before installation. Brake shoes show up well in this view



Four bolts attach hangar to railway car truck. Bearing arms ride outside of wheels at the journal boxes

WHITING

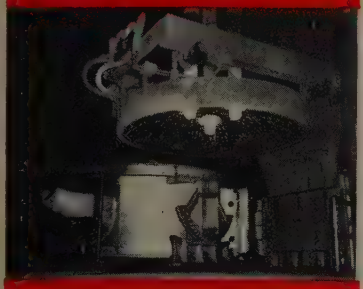
Hydro-Arc

ELECTRIC FURNACES

HERE'S THE "Pace-Setter" IN ELECTRIC MELTING!

You ask, "What electric furnace offers the most advantages?" The answer is WHITING HYDRO-ARC because of its important, advanced engineering principles! To name a few:

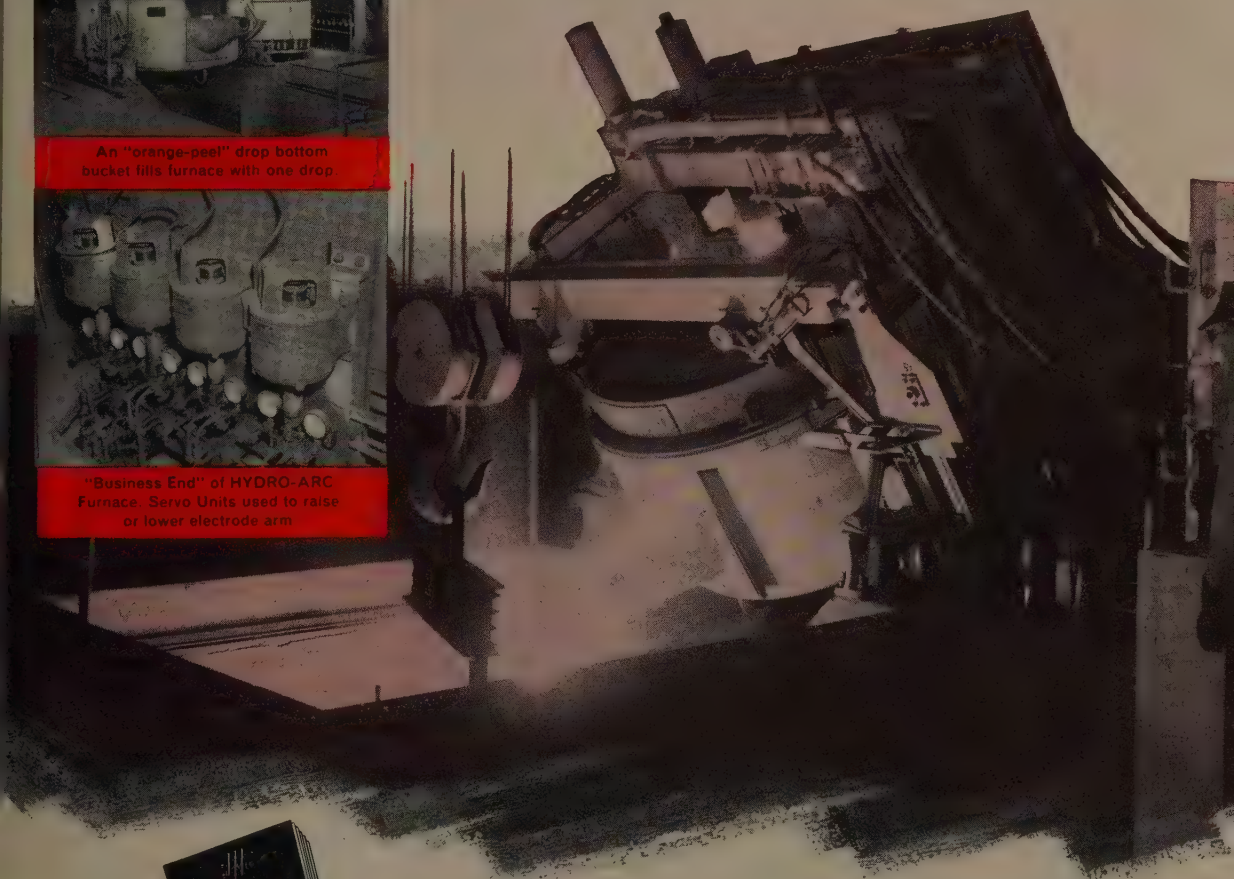
- **The Hydro-Arc Automatic Electric Clamp,** pioneered by Whiting, saves up to 90% of furnace down-time for slipping electrodes. It also means an 8% increase in operating time and production . . . and in addition, the elimination of the hazardous electrode slipping operation.
- **The Unique Hydro-Arc Top Charge,** a load factor improvement, reduces furnace down-time for recharging to only a few minutes. Because of its sound, basic simplicity, limit switches are eliminated and maintenance is held to a minimum.
- **The Hydro-Arc Air-Counterbalanced Hydraulic Electrode Positioning Equipment** assures less electrical energy and electrode consumption as well as improved metallurgical control and longer refractory life.

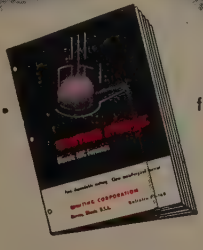


Hydro-Arc furnace with roof lifted and swung aside.

An "orange-peel" drop bottom bucket fills furnace with one drop.

"Business End" of HYDRO-ARC Furnace. Servo Units used to raise or lower electrode arm.





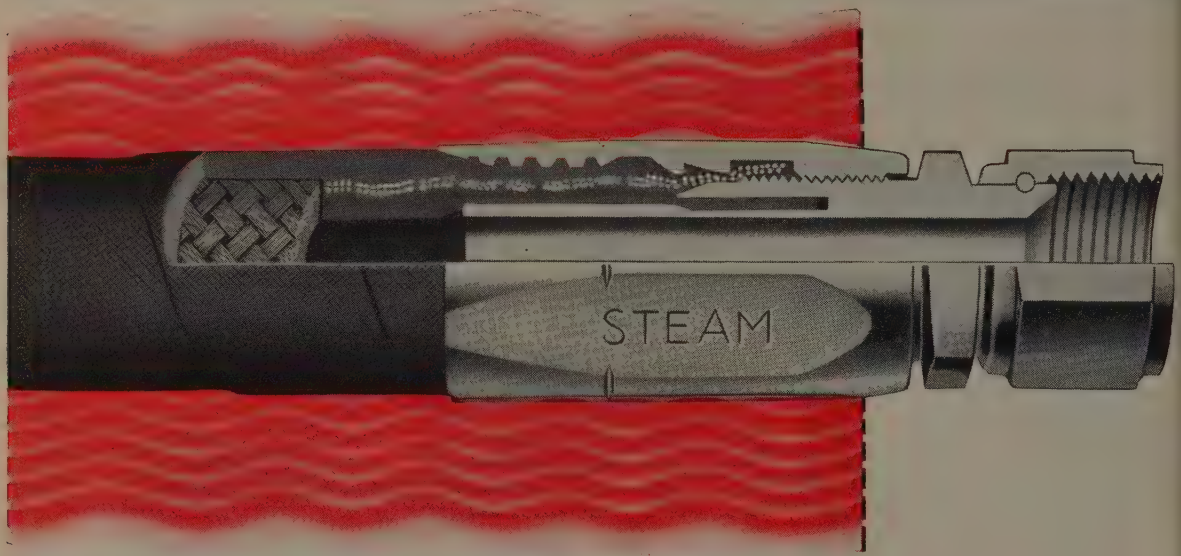
rite today . . . for 40 page bulletin FY-168. It completely describes Whiting Hydro-Arc Electric Arc Furnaces!

WHITING CORPORATION

15643 Lathrop Avenue, Harvey, Illinois

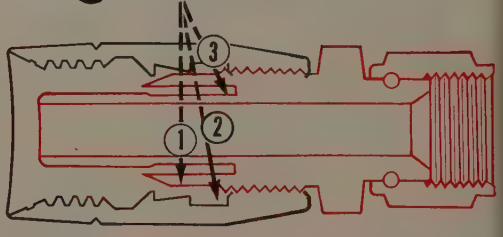
The Steam Hose Line with a FUTURE!

ANOTHER AEROQUIP FIRST!



Now . . . a steam hose line built for extra l-o-n-g life! The secret is in Aeroquip's reusable "*little gem*" fittings that assure positive attachment to the hose and never need re-tightening once assembled. The knife-like spur (1), see diagram, of the "*little gem*" separates the inner tube from the wire braid; clamping action (2) is exerted on reinforcing braid only; and a lip seal (3) is formed by the end of the inner tube in an annular chamber. The "*little gem*" is a streamlined, compact fitting with no bolts or protruding surfaces to hinder handling. In perfect combination with Aeroquip burst-proof steam hose, it offers greater efficiency and maximum safety. *Truly another Aeroquip first in better hose lines!*

Longer Life!



Aeroquip

REG. TRADE MARK

STEAM HOSE MATCHED WITH "*little gem*" FITTINGS

"*little gem*" is an Aeroquip Trade Mark

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: Burbank, Calif. • Dayton, Ohio • Hagerstown, Md. • High Point, N. C. • Miami Springs, Fla. • Minneapolis, Minn. • Portland, Ore. • Van Wert, Ohio • Wichita, Kan.
IN CANADA: Prenco Progress and Engineering Corporation Ltd., Toronto • IN ENGLAND: Super Oil Seals & Gaskets, Ltd., Birmingham

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

Alcoa Boosts Output

Capacity of firm's Mobile Alumina Works is increased by 33 per cent

EXPANSION of facilities of the Mobile Alumina Works, Mobile, Ala., of Aluminum Co. of America, Pittsburgh, has been completed. Duncan C. Smith is manager of this facility.

Capacity of the plant was increased by 33 per cent during the expansion program that began in October, 1951.

Needs Grow—To supply the increased demand for bauxite resulting from the expansion, an additional 50 ore ships will be unloaded at Mobile each year. An additional 70 freight cars will be needed each week to ship the increased output of alumina.

The increased facilities will make available sufficient alumina to produce considerably over 100,000 tons of aluminum metal per year. This increase in output for one year would alone be enough to keep Alcoa's new Rockdale, Tex., smelter operating for about 5 months.

Facilities—New equipment added at Mobile involved all facilities for refining ore under the Bayer process. Among the several new installations were a digester unit, new filter presses and precipitators, and a new calcining kiln.

The powerhouse at Mobile was changed substantially. A new boiler, turbine and air compressor were installed. New steam lines to supply the new digester unit were constructed.

A storage building was erected to handle the greater supplies of ore that will be received from the Caribbean to fill the increased demand for raw materials for the refining process. Additional conveyors were built to this building, existing conveyors were enlarged, and bauxite handling facilities were expanded. The Alabama State Docks facilities for unloading bauxite were increased in conjunction with Alcoa's expansion to handle the greater incoming supplies of bauxite.

The new grinding facilities installed are a slight modification of earlier equipment. These facilities permit the handling of both dry and wet bauxites, whereas old equipment handles only dry bauxite.

During expansion of the refining facilities, a new office building was added to the Alcoa Mobile Works.

Foundry To Build Warehouse

Arkansas Foundry Co. will erect a warehouse at 1423 E. Sixth St., Little Rock, Ark., as part of its expansion program.

Forms Canadian Subsidiary

Mechanical Handling Systems Inc., Detroit, established manufacturing facilities in Windsor, Ont., to be operated by Canadian Mechanical Handling Systems Ltd. The firm has facilities for designing, building and equipping entire factories for automatic production.

Stampings Firm Expands

John Volkert Metal Stampings Inc., Queens Village, Long Island, N. Y., completed its third major plant expansion in the last four years. Volkert, manufacturer of precision stampings and assemblies for the electronics industry, added 12,000 sq ft of floor space, bringing its total plant area to more than 30,000 sq ft.

Latrobe Steel Opens Branch

Latrobe Steel Co., Latrobe, Pa., tool steel producer, opened an office in St. Paul. It will be operated by James Terry who formerly represented the company in Cincinnati.

Stauffer Chemical Moves

Stauffer Chemical Co. moved its headquarters to 380 Madison Ave., New York 17. The company started operating its new $3.5-million plant in Louisville under managership of H. L. McLean.

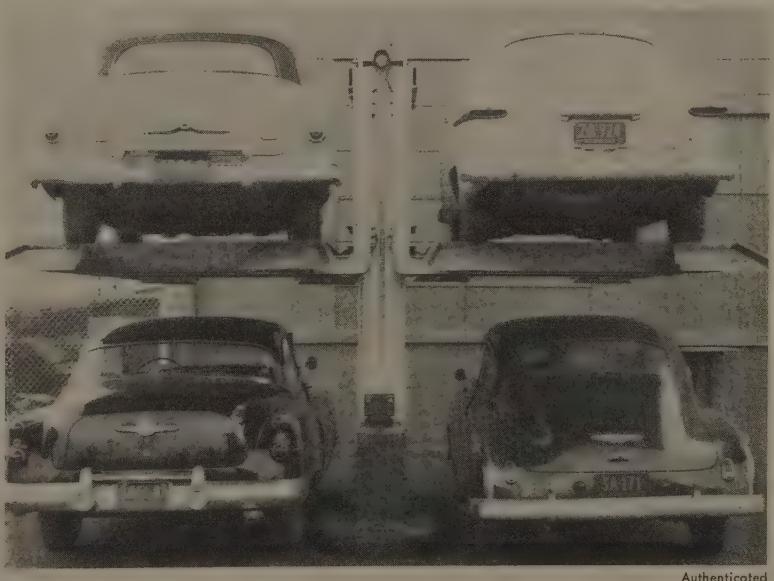
Kewanee-Ross Names Agent

Kewanee-Ross Corp., Kewanee, Ill., appointed Debco Equipment Co. Inc., St. Louis, as its representative in that territory.

Beesley Enlarges Plant

Beesley Mfg. Co., Los Angeles, added 2400 sq ft to its plant for the fabrication of component parts for the aircraft industry. Everett

(*Please Turn to Page* 86)



Authenticated

Vertical Double Parking Offered Harassed Motorists

Parking is due to get a new look in congested urban areas. Simmons Machine Tool Corp., Albany, N. Y., has introduced the Sky-Park, a hydraulic lift machine that doubles the parking space in any area with 12-ft ceilings. This device, shown above, lifts cars into the air, one at a time, and secures them there for any length of time. Another car can be parked under each elevated car

Fairbanks-Morse saves floor space,

In machining electric motor shafts, Fairbanks-Morse uses a Hydra-Trace attachment mounted in place of the compound rest on a LeBlond 16″ Heavy-Duty Engine Lathe. This shaft is machined from 3¾″ 1245 steel bar stock. Rough and finish cuts are run at 318 rpm (average, 325 sfm) with the feed set at .0168 ipr. .012″ to .015″ surplus stock is left for finish grinding.

slashes tool costs with Hydra-Trace *

LeBlond Lathe plus Hydra-Trace replaces two automatics—machines 55 different shafts in lots of 25 to 150.

Before Hydra-Trace, F-M produced its motor shafts on a pair of automatic lathes. Each turned one end of the step shafts; each used seven tools and two tool blocks. Frequent set-up changes—*each requiring eight hours*—more than ate up the time saved by automatic production.

Then Fairbanks-Morse consulted our Chicago office, purchased a 16″ Heavy-Duty Engine Lathe equipped with Hydra-Trace. Here are the results:

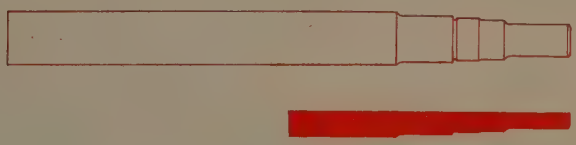
Set-up time became Production Time. Hydra-Trace setup per shaft end takes only 15 minutes—for a total of 30 minutes. Result—7½ former setup hours became available for production.

Floor space saved. One machine does the work of two. (Overall average production is equal.)

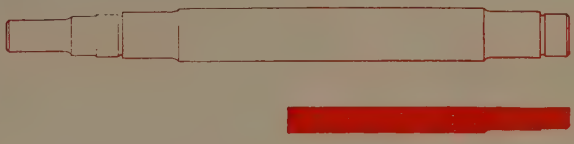
Tool costs slashed. Two tools replace 14. Tool life increased 33%.

Storage problem simplified. Hydra-Trace templates are flat, easily made, much simpler to store and locate than bulky tool blocks (or master shafts).

Hydra-Trace can replace the compound rest of virtually any LeBlond lathe built since 1935. And operators of only average skill can easily operate this heavy-duty, hydraulic tracer.



A typical shaft-turning operation—Hydra-Trace automatically follows template 1 as first-phase rough and finish cuts are taken on one run of shafts.



Then, the shaft ends are reversed. The second template is set and the second machining phase completed.

Whether you are cutting step shafts, contour facing or turning forms—a LeBlond Heavy-Duty Lathe with Hydra-Trace will prove the most versatile, the most dependable machine in your shop. You can use it as a duplicating lathe on production runs; then, in minutes, replace the Hydra-Trace attachment with the standard compound rest for regular work.

For more information on LeBlond Heavy-Duty Lathes, see your nearby LeBlond distributor or write—

THE R. K. LEBLOND MACHINE TOOL CO. CINCINNATI 8, OHIO

Write for Bulletin HT-4G for the complete Hydra-Trace story.

TRADE MARK, REGISTERED U. S. PAT. OFF.

turned faster by

LeBLOND *of Cincinnati*

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 64 YEARS

(*Continued from Page* 83)

F. Beesley, a partner of the company, is in charge of operations.

Panellit To Build Plant

Panellit Inc., Chicago, manufacturer of industrial automatic control and information systems, is constructing a plant at 7401 Hamlin, Skokie, Ill. It will be occupied by the parent firm and its two subsidiaries: Panalarm Products Inc., maker of electrical devices, and Panascan Inc., maker of large-scale multiple systems.

Continental Can Names Agent

Continental Can Co., New York, appointed Simpson & Co., Memphis, Tenn., as manufacturer's agent for its metal pantryware line in that territory.

Will Make Chrome Chemicals

Three English companies recently amalgamated under the name of British Chrome & Chemicals Ltd. with headquarters at Eaglescliffe, England. The firm has formed a Canadian company with offices in Toronto, Ont.

The three companies are John & James White Ltd., Glasgow; Eaglescliffe Chemical Co. Ltd., and E. P. Potter & Co. Ltd., Little Lever, Bolten, Lancashire. All have been prominent in the manufacture of chrome chemicals.

Hugh Ward Price is the vice president, sales. Other officers are W. Astles, London, England, president; M. J. C. Hutton-Wilson, Eaglescliffe, Durham, England, vice president; and M. R. Jenings, Toronto, director and secretary-treasurer.

Cooper-Bessemer To Expand

Cooper-Bessemer Corp., Mt. Vernon, O., plans to purchase the land and buildings of Northwestern Elevator & Mill Co., that city. The companies adjoin each other. Cooper-Bessemer plans to expand its manufacture of compressor equipment and turbochargers. Northwestern Elevator & Mill is expected to move its operations to the Fostoria mill of the Mennel Milling Co., Toledo, O., its parent organization.

Nelco Buys Tool Firm

Purchase of Modern Tool Co. rounds out Nelco's line of carbide-tipped tools

NELCO TOOL CO., Manchester, Conn., purchased Modern Tool Co., Berlin, Conn.

This is part of Nelco's expansion program and results in an increase of 30 per cent in personnel and the addition of 5500 sq ft of manufacturing area complete with modern machinery. The new building will be known as the Modern Tools Division of Nelco Tool Co.

The plant will continue to manufacture and market its present line of products, including high-speed steel forged tools, high-speed steel and carbide tools and milling cutters, and milling machine accessories. These tools will complement and round out the broad line of carbide-tipped tools now manufactured and sold by Nelco Tool Co.

Plans to produce custom engineered carbide cutting tools in the Modern Tools Division are being formulated in the main Nelco plant in Manchester.

Thomas Hollis, vice president and general manager of Nelco, appointed William A. Coe as general manager to direct operations at the Berlin plant. Hans Nelson, former president of Modern Tools Co., will continue to be associated with the company in an advisory capacity.

Union Metal Names Agent

Union Metal Mfg. Co., Canton, O., appointed Ed. F. Dodge & Associates as its eastern Michigan materials handling agent. This agency, which will continue to represent Union Metal in the Detroit area, has offices in Detroit, Birmingham, Oxford and Metamora, Mich.

Plan $4.5-Million Project

Western Electric Co. and Pacific Telephone & Telegraph Co. have united in a joint venture for the construction of a $4.5-million distributing and supply center in San Leandro, Calif. The plant will occupy a 30-acre site. Western Electric's project, a distributing house, will cost approximately $3.5 million and the PT&T supply center will cost nearly $1 million. This will more than double facilities maintained by the two firms in nearby Emeryville, Calif.

Mercer Foundry Co. Formed

Mercer Foundry Co., Dayton, O., a newly formed company, purchased the gray iron foundry castings building from Dayton Malleable Iron Co., that city.

Donegal Widens Sales Service

Donegal Mfg. Corp., Marietta, Pa., producer of carbon, low-alloy and stainless steel castings, expanded its sales engineering service. In addition to sales engineering services provided from the firm's headquarters, the following will represent the company: Engineered Specialties Co., Wallingford, Conn.; Byrne & Dersofi Inc., New York; E. F. Frey, Drexel Hill, Pa.; C. A. Lapp, Cleveland; and John E. Mullen Jr. and John E. Mullen Sr., Erie, Pa.

Toolmaker Buys Buck Bros.

Great Neck Saw Manufacturers Inc., Mineola, N. Y., purchased the capital stock of Buck Bros. Inc., Millbury, Mass. Operations in Millbury will continue with Joseph C. Cort, the present manager, in charge. Great Neck Saw has been engaged in the manufacture of hand tools since 1930 and the chisels made by Buck Bros. will complement the present line. It is expected Millbury operations will be expanded.

Monarch Machine Moves Branch

Monarch Machine Tool Co., Sidney, O., moved its Pittsburgh district office to 962 Greentree Rd., that city. W. B. Craig is district manager for this producer of engine, toolmakers' and production lathes.

Research Firm Opens Branch

National Research Corp., Cambridge, Mass., opened a sales office at 4205 Chester Ave., Cleveland 3. George A. Goetz is the representative in that city. The corporation's Equipment Division

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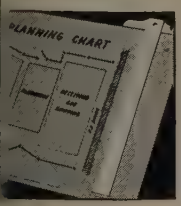
provides EXTRA property protection at NO EXTRA cost!



EXTRA Planning: Continental fence engineers tailor fence to fit your property with anticipated future plant growth and department expansion in mind. Money saving methods increase fence economies to give you top value for your fence dollars.

EXTRA Quality Materials: Continental fence fabric is made of Konik steel for increased tensile strength and greater rust resistance. Full gauge wire is woven in exact mesh and then "hot dip" galvanized throughout for extra years of protection and smart appearance.

EXTRA Construction: Continental specially designed H-Section line posts are 15% heavier—resist bending at right angles to fence line, where most damage occurs. All posts are set in solid concrete for perfect and permanent alignment. Trained construction crews combine superior materials with experienced skill to give you added years of fence security.

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Konik steel contains copper, nickel, chromium for greater strength and rust resistance.

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PRODUCERS OF: Manufacturers Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Lacquer Finished, Bright, and Special Wire. Also, Coated and uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Continental Steel Corp., Kokomo, Indiana

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with headquarters in Newton Highlands, Mass., manufactures high-vacuum equipment, including diffusion pumps, mechanical rotary vacuum pumps, furnaces, coaters, valves, seals and gages.

Neomatic Expands Plant

Neomatic Inc., manufacturer of electrical equipment, is expanding its present plant at 9010 Bellanca, Los Angeles. The company has grown from one employee to approximately 100 in four years of business. T. Ross Welch is president.

Chemold Co. Opens Plant

Chemold Co., producer of glass fiber reinforced building panels and custom molded parts, opened a plant at 2000 Colorado Ave., Santa Monica, Calif. Kenneth D. Smith is president.

Beryllium Corp Names Agent

Beryllium Corp., Reading, Pa., appointed Peckover's Ltd., Toronto, Ont., and Montreal, Que., as a distributor of its beryllium-copper wrought materials in Canada.

Canadian Firms Unite

Bridge & Tank Co. of Canada is organized to operate Hamilton Bridge and Vulcan Iron

FORMATION of Bridge & Tank Co. of Canada Ltd., Hamilton, Ont., to unite the operations of Hamilton Bridge Co. and Vulcan Iron & Engineering Ltd., was announced by James A. Gairdner, chairman of the board of the new company.

Bridge & Tank Co. will own directly and through subsidiaries two large plants in Hamilton and one in Winnipeg, Man. Its plants and organization will be strategically located and will be integrated to ensure a national participation in the steel business from coast to coast.

Subsidiaries—Purchase of Hamilton Bridge Co. will include controlling interest in Sawyer-Massey Ltd. (road machinery) and Rheem Canada Ltd. (steel drums). Purchase of Vulcan Iron will include Vulcan Machinery & Equipment Ltd. Vulcan Machinery is one of the largest steel fabricating and machinery sales companies serving western Canada.

A. B. Hill, president and general manager of Bridge & Tank Co., says that a program of improvement and modernization of the Vulcan Iron plants at Winnipeg is under way and that a similar program for the Hamilton plants will be undertaken immediately. One of the first steps will be a full-scale entry into the storage tank and platework field.

Vulcan Iron designs, fabricates and erects storage tanks, elevated water tanks and pressure vessels for the chemical, oil and gas industries and is affiliated with Hammond Iron Works Inc., Warren, Pa.

The former Hamilton Bridge Co. will operate as the Hamilton Bridge Division; Vulcan Iron & Engineering Ltd., continuing to operate as a separate company, will be the western division of the new firm.

In addition to Mr. Gairdner, officers of the new firm include A. S. Jenkins, vice chairman of the board; A. B. Hill, president and general manager; G. W. Wigle, vice president.

Toolmaker To Build Plant

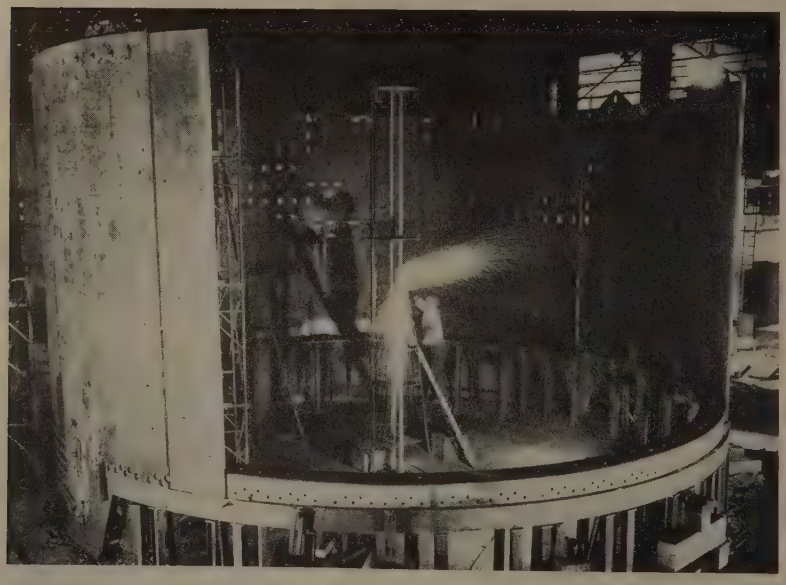
Tapmatic Corp., Costa Mesa, Calif., affiliated with Swedish Precision Tools Unlimited, purchased a 94,500-sq-ft site in Costa Mesa, Calif., and will construct a $200,000 plant for manufacturing of precision tools.

Canadian Foundries Unite

William Kennedy & Sons Ltd., Owen Sound, Ont., purchased the business of Northern Foundry & Machine Co. Ltd., Sault Ste. Marie, Ont. The Kennedy company, in business for over 96 years, operates steel, bronze and iron foundries. Northern Foundry has been in business since 1907.

Standco Canada Ltd. Formed

Standard Pressed Steel Co., Jenkintown, Pa., organized a wholly owned subsidiary, Standco Canada Ltd., 193 Bartley Drive, Toronto, Ont. Standco is a selling, warehousing and distributing concern for the parent firm's socket head screws, locknuts and collars. Williams & Wilson will continue to rep-



Tunnel Shield Will Bore Tube Under Hudson River

A workman is shown grinding a support on the tunnel shield being fabricated at American Locomotive Co.'s plant in Schenectady, N. Y., for the third tube of the Lincoln tunnel, New York. The shield will be a key piece of equipment in building the new tunnel as it will constitute the actual cutting edge used to thrust the tube through the bed of the Hudson river. It is scheduled for delivery in March

NO BETTER BLADES OR BANDS

Starrett®

You can't buy better hacksaws, band saws or band knives than STARRETT. They're precision made by the "World's Greatest Toolmakers" in a new streamlined plant to give you a lot more clean, fast, trouble-free cutting. By simply specifying STARRETT blades or bands you can count on better, faster production —less cost—less time out for blade changing . . . whether you cut, saw or slice.

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Your Industrial Distributor

Because your local industrial distributor stocks and sells the complete Starrett line, you can always count on prompt, dependable, quality service. He'll gladly suggest the one best, most economical blade or band for your cutting operations. The complete line includes hacksaws for hand or power cutting — band saws for cutting metal, wood, plastics, contour cutting, friction sawing, etc. — and band knives for cutting soft or fibrous materials.

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TOOLS AND PRECISION INSTRUMENTS • DIAL INDICATORS • STEEL TAPES
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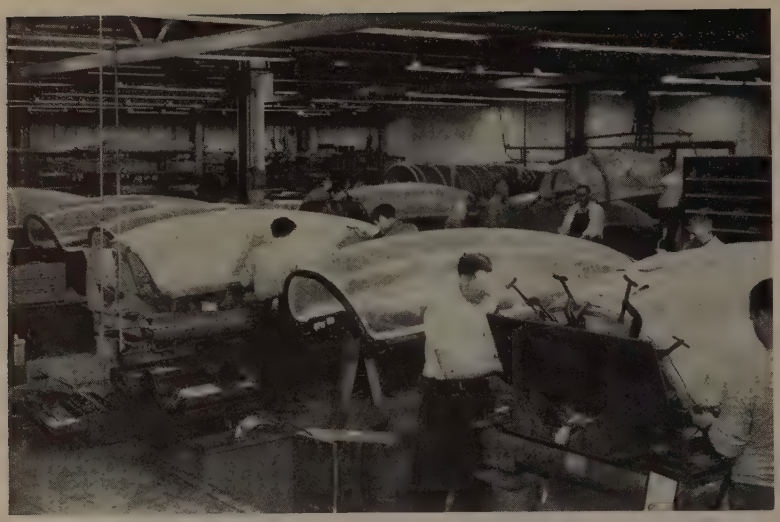
THE L. S. STARRETT COMPANY, ATHOL, MASSACHUSETTS, U. S. A.



Goodyear To Duplicate Canopy Assembly Operations

Employees in Canopy & Laminates Division, Goodyear Aircraft Corp., Akron, O., are shown producing complete canopy assemblies, which include plastic enclosures and metal framework, for jet bombers. This scene will be duplicated soon at the firm's Litchfield Park, Ariz., plant where a new type assembly will be produced. Stainless steel ducting utilized in leading edges of wings, fins and stabilizers of jet planes for anti-icing purposes, in addition to various sections of the fuselage for air conditioning, is being produced at both of these Goodyear plants

resent the firm in the Montreal area. James P. Price, vice president, is general manager of the Toronto subsidiary.

Diamond Machine Opens Branch

Diamond Machine Tool Co., Pico, Calif., manufacturer of punch presses, power squaring shears and milling machines, opened an office at 420 Market St., San Francisco. Henry Dansereau was appointed district manager.

Allis-Chalmers Names Agent

Allis-Chalmers Mfg. Co., Milwaukee, appointed Albany Wholesale Supply, Albany, Oreg., as a distributor for its motors, controls and transformers.

Will Build Plant in Brazil

LeTourneau-Westinghouse Co., Peoria, Ill., a subsidiary of Westinghouse Air Brake Co., Wilmerding, Pa., will build a plant near Campinas, Brazil. Initially the plant will produce parts for the firm's earth-moving equipment; later on, the plant will produce the earth-moving machines themselves. The plant will be the property of Tratores do Brazil, S. A., a newly established operating subsidiary which is 75 per cent owned by LeTourneau-Westinghouse.

Ductile Iron Changes Hands

Ductile Iron Foundry Co., Stratford, Conn., was acquired by Hartford Electric Steel Co., Hartford, Conn. New pit-type annealing furnaces, cleaning and control devices are being installed.

Brown Gets Association Post

H. B. Brown, United States Gypsum Co., Chicago, was elected president of Metal Lath Manufacturers Association, Cleveland. D. L. Rossiter, Inland Steel Products Co., Milwaukee, was re-elected vice president.

Gagel Heads Distributors

Associated Equipment Distributors, Chicago, elected as its president for 1954 George W. Gagel, Machinery & Supplies Co., Kansas City, Mo. Other officers are R. J. Finn, Bode-Finn Co., Cincinnati, executive vice president; S. F. Laskey, Northwestern Equipment Inc., Fargo, N. Dak., and L. Miner Doolen, Telford Equipment Co., Lansing, Mich., vice presidents; F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass., treasurer.

Plans $100-Million Project

Texas City Chemicals Inc., Texas City, Tex., may begin a $100-million expansion program this fall. Start of the project hinges on the success of a research program now under way and involving development of a process for recovery of uranium from phosphate rock. The firm has a contract with Atomic Energy Commission, Washington.

Mathews Conveyer Expands

Mathews Conveyer Co., Ellwood City, Pa., is constructing an office and engineering building and an addition of about 25,000 sq ft to its present manufacturing area. Mathews produces gravity and power conveyors and special conveying machinery.

EFCO-Lindberg Ltd. Organized

Lindberg Engineering Co., Chicago, organized EFCO - Lindberg Ltd., with headquarters at 544 Inspector St., Montreal, Que. This company combines the resources of Electric Furnace Co. of England, Williams & Wilson Ltd. of Canada, and Lindberg Engineering. EFCO-Lindberg will make heat-treating and melting furnaces.

Protectall Safe To Move

Protectall Safe Corp. will move from Syracuse, N. Y., to new and larger quarters at Hamilton, O., by April 30. Edwin H. Mosler Jr. is president of the safe manufacturing concern.

Westinghouse Names Agent

Westinghouse Electric Corp.'s Air Conditioning Division, Hyde Park, Mass., appointed Enterprise Heat & Power Co., Chicago, as a distributor of its equipment in that territory.

Vapor Heating Moves Plant

Vapor Heating Corp. and its subsidiary, Roth Mfg. Co., moved into its enlarged plant at 6420 W. Howard St., Chicago 31. Executive and sales offices are at 80 E. Jackson Blvd., Chicago 4. The company makes steam generators, railway equipment and aviation electronic controls.

f your
product
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metalworking...

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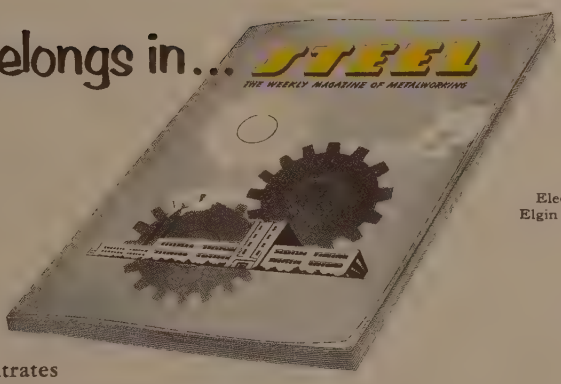
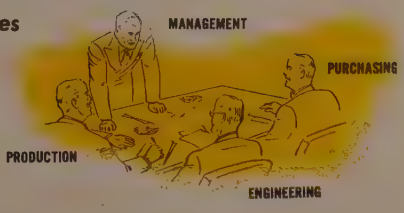


The market for machine tool accessories is STEEL's market—the 17,000 plants where well over 70% of all machining is done. Key management, production, engineering and purchasing men in these plants read STEEL. It concentrates upon the problems of their industry, reporting the news, market and technical information they need. One more reason that STEEL is the logical choice as the *basic paper* to reach machine tool users. STEEL • Penton Building Cleveland 13, Ohio

You advertise in STEEL to reach all four buying influences

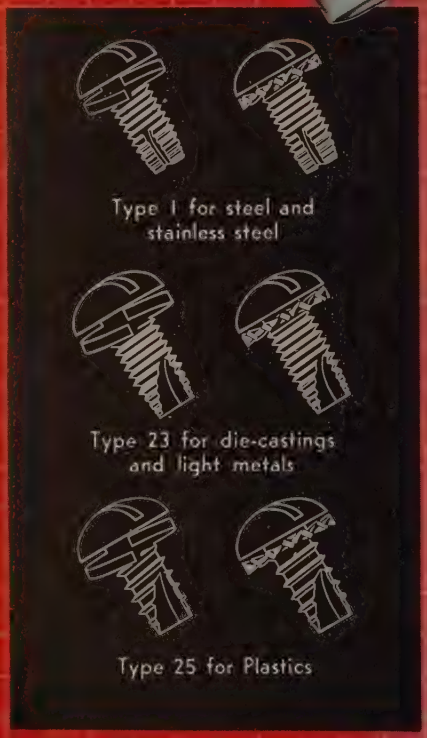


These 52 manufacturers of machine tool accessories advertised in STEEL during 1952

Abrasive Products, Inc.
The Allison Co.
American Shear Knife Co.
Apex Tool & Cutter Co., Inc.
E. C. Atkins & Co.
Barber-Colman Co.
Bay State Abrasive Products Co.
Bokum Tool Co.
Carborundum Co., Abrasive Div.
Clemson Bros., Inc.
Sterling Grinding Wheel Div., The Cleveland Quarries Co.
Cleveland Twist Drill Co.
Clipper Manufacturing Co.
The Cleveland Steel Tool Co.
Cowles Tool Co.
Detroit Broach Co.
The Eastern Machine Screw Corp.
Electro Refractories & Abrasives Corp.
Elgin National Watch Co., Abrasives Div.
Ex-Cell-O Corp., Continental Tool Works Div.
Carboloy Department of General Electric Co.
Gorham Tool Co.
Greenfield Tap & Die Corporation
Heppenstall Company
Illinois Tool Works
Ingersoll-Rand—Grinders
Kennametal, Inc.
Lavallee & Ide, Inc.
T. H. Lewthwaite Machine Co., Inc.
Geo. F. Marchant Co.
Maxwell Company
Mead Specialties Co.
W. F. Meyers Co., Inc.
Mid-West Abrasive Co.
Minnesota Mining & Mfg. Co.
Behr-Manning Corporation, Div. of Norton Co.
Norton Company—Abrasives
The Ohio Knife Co.
Ready Tool Co.
Reed Engineering Co.
Severance Tool Industries, Inc.
Simonds Abrasive Co.
Simonds Saw & Steel Co,
Tompkins-Johnson Co.
United States Drill Head Co.
United States Rubber Co., Mechanical Goods Div.
Morse Twist Drill & Machine Co., Div. of Van Norman Co.
Victor Saw Works, Inc.
Q. S. Walker Co., Inc.
Wapakoneta Machine Co.
Wendt-Sonis Co.
Wittek Mfg. Co.

Eaton - Reliance
Thread - Cutting

SPRINGTITES & SEMS
Fabricate Products
Faster at *Less Cost*



THE elimination of one expensive machining operation on the production line can sometimes mean the difference between profit and loss on a job. If you have a fastening operation which necessitates tapping, look into Eaton Reliance Thread-cutting Springtites and Sems. They are self tapping and actually tap as they fasten. It's all done in one operation wherein the clean, tightly seated threads don't have a chance to mis-mate or strip.

Your production people will find them easy to use regardless of the material. Manufactured with built-on helical or multi-toothed type washers, they are made for steel and stainless steel, die-castings and light metals, and plastics. Also available without washers. Many design engineers and production men are effecting great savings through faster production. For more detailed information write for our Engineering Bulletin S-49A. It's yours for the asking and of course, there's no obligation.

RELIANCE DIVISION EATON MANUFACTURING COMPANY

OFFICE and PLANTS: 514 Charles Ave. MASSILLON, OHIO

Springtites & Sems · Snap & Retaining Rings · Special Steels · Spring Lock Washers · Hex-Fas-Ner

SALES OFFICES: New York · Cleveland · Detroit · Chicago · St. Louis · San Francisco · Montreal

Technical Outlook

MOLY WELDS— Ductile molybdenum welds are possible, according to Battelle Memorial Institute. Metal must have high purity—even 0.0025 per cent oxygen will cause brittleness; and welding must be done in high vacuum to avoid contamination. High purity metal is made by multiple vacuum, arc melting or high-temperature, high-vacuum heat treatment of commercial moly powder. Inert gases are said to be too impure for protection in welding.

BRAINY VENTILATOR— An electric fan with what amounts to a brain has a thermostatic control in its 20-inch blade. Fan starts when the room temperature rises, shuts off when it cools down. It's also portable and reversible.

STOPS RUST— Mixture of pure zinc and rubber latex which can be brushed or sprayed on iron and steel bars as a protective coating is the latest corrosion stopper, reported by the Natural Rubber Bureau. Called Cowanite, mixture can be applied over rust and adhering scale, and it has the covering qualities of high-quality paint. The zinc content helps prolong indefinitely the life of any iron or steel on which it is applied.

DUAL HARDENING PROPERTIES— New air-hardening tool and die steel combines deep hardening characteristics of air hardened steels and low temperature heat treating of oil hardening tool and die steels. Produced by Carpenter Steel Co. new Vega provides heat treating accuracy. It's used for large blanking, forming, trimming, notching dies, heavy duty punches, etc.

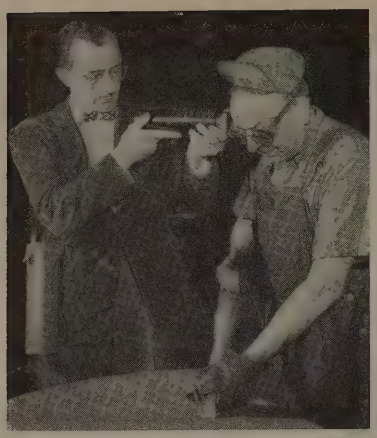
HEAT TREATING TITANIUM— Methods of heat treating titanium-base alloys to give outstanding tensile properties over a wide strength range are reported in a study, "Development of Titanium-Base Alloys," made for the Air Force by Battelle Memorial Institute. Battelle's experiments indicate it may be possible commercially to solution-treat certain alloys at about 1300°F, machine or form a part, then age-harden the part to high strength. These alloys may be stable for extended periods at 600°F operating temperatures.

NEW SPECS— Two recommendations for new test specifications of considerable significance came out of American Society for Testing Materials' recent committee week in Washington. In the first, a letter ballot will propose that the 20 per cent salt solution for testing corrosion of nonferrous metals and alloys be replaced by a 5 per cent solution. The second will upgrade specs for annealed nodular iron. The 60-45-10 grade specifying 10 per cent elongation was recommended for change to 60-45-15, with 15 per cent elongation.

ALLOY FORMATION— A University of California scientist, anticipating innumerable new alloys, is setting out to learn how the metallic mixtures hold themselves together. The project, directed by Dr. Ralph R. Hultgren, will make systematic measurements of the forces that hold different kinds of metallic atoms together in alloys and possibly come up with some answers about how metals behave in combination.

PRESSURE ON H-BEAMS— U.S. Steel Corp.'s effort to get steel bearing piles approved for foundation construction was concluded Feb. 17 with a successful test conducted by Armour Research Corp. in Chicago. In an average Chicago Loop building, a single pile would have to support about an 80-ton load, but building codes require twice the given weight in tests. U.S. Steel's test beam was driven down 105 feet to bedrock, then subjected to pressure built up to 625 tons before buckling.

Metalworking Outlook—p. 43 Market Outlook—p. 151



Noise made by foundry chipper is being checked at ear level by a technician trained by Allis-Chalmers Co.

Pre-employment exam should include a hearing te Previous exposures to noise should be ferreted o

It's Time to Give Noise a Hearing

Factory din can lead to hearing loss claims by employees, but the immediate problem is to dampen those noises that directly influence day-to-day productive output

By HARRY CHANDLER
Associate Editor

"IS the shift changing?" asked the visitor at the aircraft plant when the six-man crew in the propeller grinding room suddenly dropped its work and made a hasty exit from the area.

"No. They take a break every 30 minutes," was the explanation.

"Doesn't that play hob with production?" the visitor continued.

"Sure does," admitted the plant representative; "but it's so noisy in there, they can't stand it more than a half hour; in fact, they say their ears keep right on ringing for an hour or two after they leave the plant."

Women Started It—That scene and similar ones have been taking place in industry ever since men started to work with earbanging machinery and tools, but it took the women to get something done about it. When they did pinch-hit duty on production lines in World War II, their complaints about factory din actually did management a favor, for they pointed the way to a new angle on worker efficiency.

Noise, management soon found out, impairs health, morale and (in the sum total) production, according to a paper by George I. Smith of the Acoustical Materials Association. What's more, he indicates, worker fatigue, often a by-product of noise, can play a heavy hand in putting accident rates on the up trend. A study of 2678 mishaps showed fatigue as a contributing cause in 82 per cent of them.

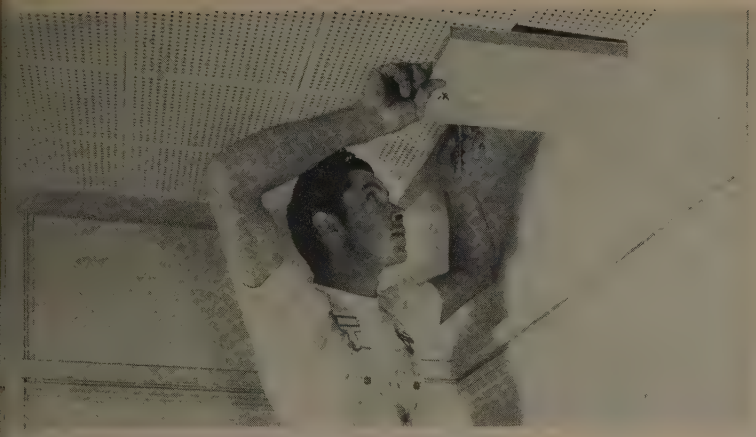
Direct link between noise and production is dramatized by the example of the propeller grinding room.

Anatomy of Noise—In the propeller grinding room, noisemen measured the din at 102 decibels; or, in better-known terms of loudness, about 10,000 times noisier than a conversation in an ordinary tone of voice. This puts the grinding room in the deafening bracket with thunder, artillery, riveting, elevated trains and boiler factories, for example. A husky air-raid siren puts out about 130 decibels at close range.

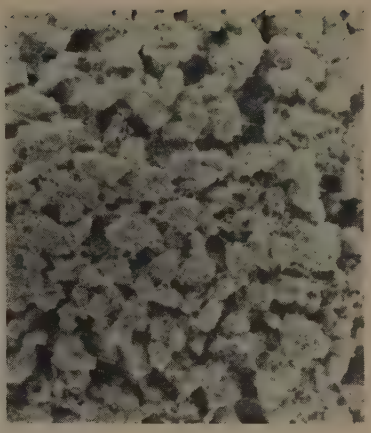
But decibels alone do not tell the story. Reason why can be found in TV talent shows. When the announcer warns the audienc not to whistle or scream in votin for its favorites, he means tha applause meters measure in dec bels. Squeals and other shrill ex pressions of approval have a fr quency different from hand cla ping. So a change in frequenc throws off the reading. "Oh" an "Ah," for example, may weigh th same in decibels, but their frequen cies are different.

Frequency, then, is looked upo as that part of noise that gets o the worker's nerves via his ear In an Acoustical Materials Associa tion booklet, Dr. Paul E. Sabin says: "The difference in sensatio produced by a change in frequenc is spoken of as the difference i pitch. Frequency is expressed i cycles per second; pitch in tone of the musical scale."

Noise and music are related. W know, for example, that a pian has a frequency range of 27 t 4186 cps; a bass viol, from 41 to 24 cps. But music (unlike noise) ha a single definite frequency or combination of simply and definite ly related frequencies.



om 97 to 99 per cent of the sound that hits a smooth rd surface (plaster here) bounces back into the room



Sound proofing material under magnification indicates how its sponge-like surface is able to absorb noises

How Noise Works—Gritty shriek the propeller-room grinding heels was in the high frequencies. his source of worker irritation as aggravated by the acoustics the room.

Sound bounces off a smooth, rd surface (such as plaster, a asonry wall, concrete floors, ass windows and skylights) like ght is reflected by a mirror. Surces can throw back from 97 to per cent of the sound waves that rike them.

Reflected sound waves ricochet everberate) back and forth, up d down and across a room until ey die out (decay). In a large ctory room, decay can take sevral seconds.

Of course, ricocheting intensies the original sound, often proacing a ringing sensation in the rs. The longer the reverberation me, the greater is the buildup in tensity. So a tolerable but unpleasant noise can become insufrable.

Economics of Noise — Exposure n cause hearing loss; and, of ourse, both management and lar are interested in constructive medies. A stimulant in this direcon is the sudden increase in the mber of claims being filed for dustrial hearing loss.

Many firms are doing battle with ant noise. Allis-Chalmers, for exmple, has been at it since 1948, cording to W. F. Scholtz, supersor of industrial hygiene.

For Beginners — Allis-Chalmers ggests a searching out of noisy oots—followed by a plant-wide survey. Where the din is 95 decibels and above (slightly louder than a police whistle or unmuffled truck but not so loud as a boiler factory or elevated train), hearing tests on exposed employees may be in order.

Scholtz says of the standard: "A level of 95 decibels has been accepted only as a starting point for our sound-band analysis study; and does not establish a level at which hearing loss begins."

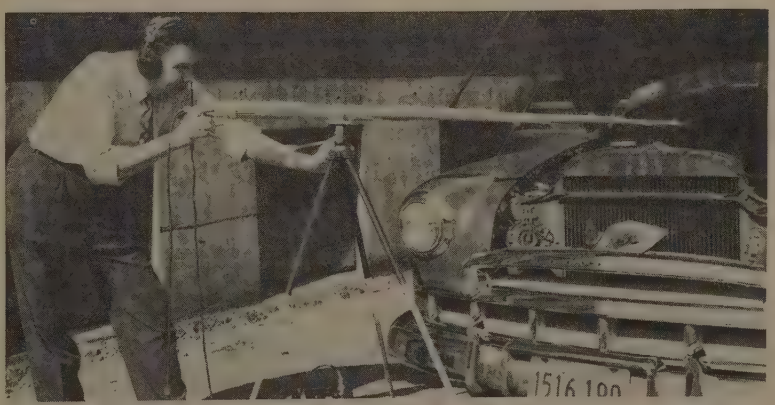
Point of the sound-band analysis is to add frequency to the decibel measurement. The tiny police whistle and the unmuffled truck have about the same loudness, but the former is in the higher frequencies, for example.

Once the program is launched, periodic, follow-up surveys should be made, including sound checkups on new, repaired or transferred equipment.

Hearing Tests — Allis-Chalmers also suggests pre-employment hearing tests (as well as the examination of current employees). Pre-employment records should include age, sex, previous work history and other noise data. Ask, for example: Have you ever worked in a boiler factory? Can you carry on a conversation without difficulty? Have you ever used ear protection? (Latter has elicited such answers as oil-soaked and dry cotton, 32-calibre shells, round-head screws and rubber erasers.)

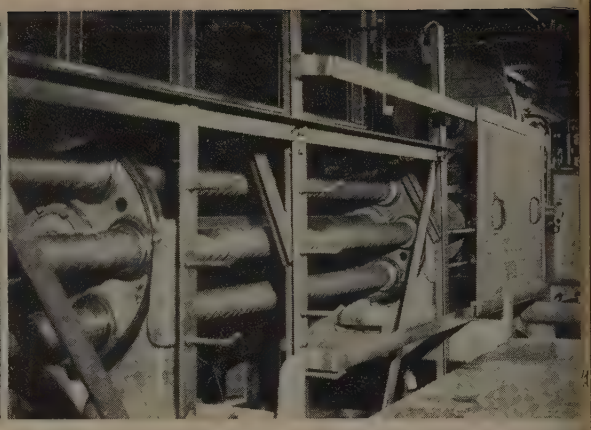
In checking over 6000 pre-employment hearing tests, Allis-Chalmers found 27 per cent of its new employees had some type of hearing loss.

They suggest: New employees going into areas above 95 decibels should be rechecked before their probationary period of three months ends—to be followed by an



This noise direction finder was developed by the physics department at Armour Research Foundation, Chicago, one of the leaders in noise work

Baffles suspended from ceiling reduced noise level by 50 per cent at John Volkert Metal Stampings Inc. plant



Bar stock rests in automatic screw machine were woun with an insulating material to cut down noise lev

exam six months later. After that, hearing can be tested during periodic physicals.

Job Placement—If an employee shows a significant loss of hearing on recheck (particularly new ones), he may have a noise-susceptible ear. If so, he should get the best possible hearing protection and be sent to an ear doctor.

About transfers, Scholtz says: "We cannot find sufficient factual information to justify transferring an individual from a noisy environment to a less noisy one. Exception is where hearing loss progresses in spite of protection."

Noise Abatement — At Allis-Chalmers each operating division has a committee to handle this (shop people are on committees, because it's felt noise is a shop problem). A helping hand is given by the hygiene section of the health and safety department.

As a starter, committees went to noise-complaint areas, and it did not take them long to find that the work can be rewarding; for only a small reduction in decibels brings improvement. The decibel scale is logarithmic; a reduction of from 6 to 10 decibels at the 100 level can mean a 40 to 56 per cent drop in loudness.

After the previously-mentioned, propeller-grinding room was sound conditioned, 12 to 15 men worked without the deafening effects felt by a crew of four to six. At that, the general noise level was diminished only 3 or 4 decibels.

How To — In the grinding room, the problem was to dampen reverberation. This could have been done by covering walls, ceiling or both with acoustical material. If this were not possible, acoustical baffles (of the same material) could be hung from the ceiling over noise sources.

Acoustical materials will absorb up to 85 per cent of the sound that strikes them, instead of throwing it back into the room. Materials may be made from cellulose fibers, cork granules, mineral or glass wool, asbestos and metal. Special mastic deadeners can be sprayed on machinery or housings; asphalt-indented felts can be used to dampen a vibrating surface, and there are mountings for machinery that include resilient vibration pads, snubbers and isolators of steel, rubber and cork.

While treatment of a room does not cut out the noise source, it does eliminate the ring and most of the reflected sound. So noise is prevented from spreading and building up. The general noise level may be reduced 50 to 60 per cent, and the room will *feel* much quieter.

Other Ways — Allis-Chalmers committees found a lot can be done through good maintenance of machines and equipment. This is hitting noise at its source. Examples of their over-all program:

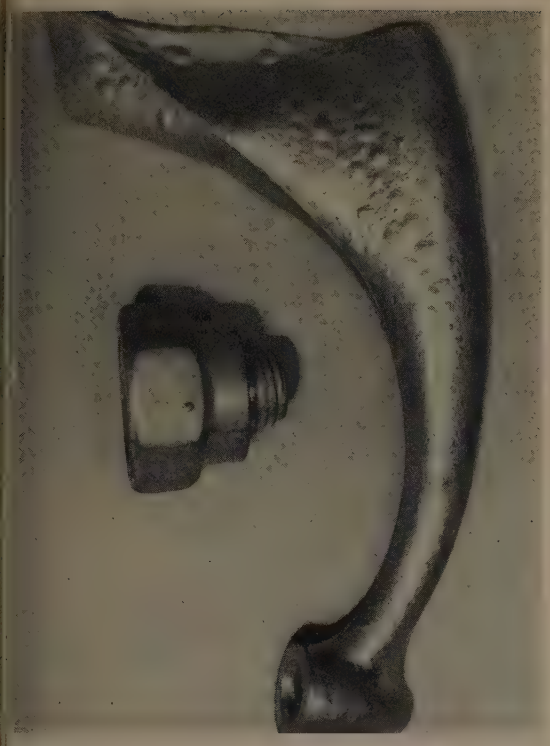
In spots where loose gears and bearings were replaced, noise was hushed 8 to 10 decibels. By replacing metal safety guards with wire-mesh safety guards, a low-frequency hum was trimmed 10 decibels. Where compressed air wa used to blow chips from recesse parts, the general noise level wa cut as much as 12 decibels by do ing the work in a small cubicl lined with acoustical board. A thir approach is isolating the noise.

By lining bar-stock feed tube on six-spindle automatic screw machines with coil springs, nois level was dropped from 95 to 8 decibels. Mufflers on the exhaus end of air vises slimmed down th level from 94 to 79 decibels; an covering metal bench tops wit wood reduced noise levels by 1 decibels.

At Source — Of course, the bes solution is to kill a noise at it origin. Noiseless typewriters ar an example. Next best thing is t "shush" wherever possible.

Many machines can be quiete with well-damped acoustical hous ings (lined with sound-absorben material) that confine a good par of the noise and prevent it fron spreading.

Another tip: Heavy equipmen should never be bolted directly t a concrete floor or other soli support; the floor will act as sounding board. A metalworkin company put in two hydraulically operated boring machines in a sec ond-story bay—placing each ma chine over a steel I-beam for sol id support. In operation, vibratio skewed the hydraulic system, an neither machine would make clea cuts. Trouble was eliminated b remounting the machines on resil ient, vibration isolators.



trapped gas comes to surface of standard castings er they are heated at 750°F for 45 minutes in lab

Vacuum casting after it was heated under same conditions. Less porosity is shown by 0.05-inch skin depth

Vacuum Die Casting Makes Debut

)WER gas content, improved skin rdness and depth, plus stronger ysicals, are the promise of a cuum die-casting process for ıc alloys.

Setup calls for a standard die sting machine with special, semi-tomatic electric controls. Any e casting die that can be normally ounted on the machine is used. course, the die must be modified hold a vacuum, but it is easily stored to its former use without ıpairment of its original condi-on, according to Nelmor Mfg. orp., Detroit, developer of the ocess.

System takes a somewhat longer cle than the conventional die sting process. The company puts this way: "As a rule-of-thumb timate, any die cast part result-g in 10 per cent or more rejects ın be cast economically by the acuum process."

The Starter — Hot scrap and ejects in Nelmor's buffing and ırome plating departments (they ast such things as rear vision mirrors and hand spotlights for the auto industry) prompted development of the process.

Other possible applications: castings that must be heated in processing, as baking during enameling; castings where finish-machining exposes porosity; castings under definite strength requirements; gas and oil pressure proof castings; castings requiring conductivity and balance; and, in general, where part design has nonventable pockets, deep draws with insufficient casting pressure or where coldshut is practically impossible.

In addition to the zinc process, the company says a vacuum casting unit of the cold chamber type for aluminum and magnesium alloys will be ready soon.

Gas—Nuts and arms cast by the standard and vacuum processes were compared. Heating brought large amounts of entrapped gas to the surface of standard castings. Much less was noted in the vacuum castings, indicating that the latter had a denser internal structure.

Comparative weights bore out differences in density. Arms cast by the standard method weighed 108.77 grams, by the vacuum method, 109.58 grams. Standard nuts weighed 48.61 grams, vacuum-cast nuts 49.07 grams.

Hardness — Standard castings showed a Rockwell H hardness of 4.2, vacuum castings, 5.9.

Zyglo fluorescent penetrant inspection showed both have sound skins. By another test, skin depth was found to be 0.03 inch for standard castings and 0.05 inch for vacuum castings. Value was arbitrarily defined as the distance from the surface to the parallel edge of the first square inch to have ten voids.

It also was observed that the increase in porosity concentration from the defined skin depth was more rapid in standard castings.

Strength — Vacuum castings showed an increase of 5.62 per cent over standard castings in tensile strength comparisons. Standard castings average 78,000 psi, vacuum castings, 82,383 psi.

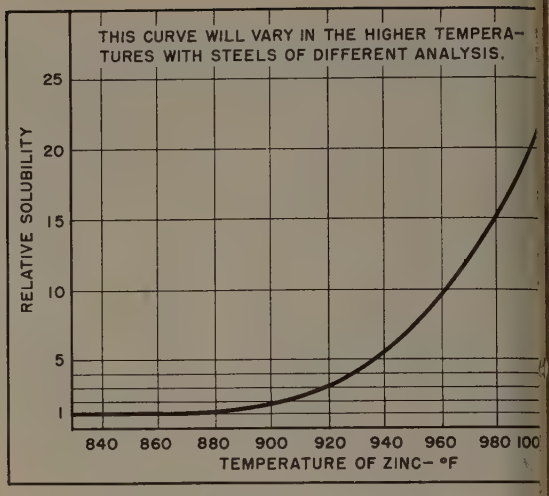


Fig. 1—Solubility of Iron in Zinc

Hot Dip Galvanizing

CONTROL OF DROSS FORMATION—

PART TWO

This is the spot where real savings can be realized. Controls (timing, temperature and cleanliness of work) automatically improve uniformity and product quality

By K. S. FRAZIER
Chief Research Engineer
Detroit Steel Products Co.
Detroit

This is the second of three articles on quality-controlled, hot-dip galvanizing by Mr. Frazier. First, which appeared last week in STEEL, dealt chiefly with coating thickness. Final article next week will cover materials and methods.

REDUCTION of dross formation is one of the major economies sought in hot dip galvanizing. Appropriate controls (timing, temperature and cleanliness of work) automatically improve uniformity and quality of the product.

Size, shape and method of heating the kettle, type of production and installation details influence the characteristics of the kettle.

Three Sources — Dissolution of iron from the sides of the standing kettle (see Fig. 1) represents the first source of dross. With production in the kettle, two other major sources appear: First, dross formed from the work itself, which is generally in proportion to work put through. Second, dross formed from the sides of the kettle. Three factors are at play here: A. Increased heat input through the sides of the kettle to replace heat absorbed by the work. B. Radiated heat from the top of the bath and C. Washing action of the molten zinc on the sides of the kettle.

Considering the second source (and referring to Fig. 1), it is seen that dross formation will increase rapidly with increased heat transmission through the sides of the kettle. Thus excessive production becomes incompatible with good economics.

Heats—If molten zinc is held at 850°F by electrical control of the heating units, a thermocouple close to the outer wall of the kettle will register 860°F with no production. As production is increased, temperature will go to about 1100°F. Since production galvanizing is periodic, this increase is fluctuating; and the average, with definite production, can only be estimated. But this gives us a reasonably close picture.

Since with no production the temperature of the air at the outside of the kettle is 860°F (and

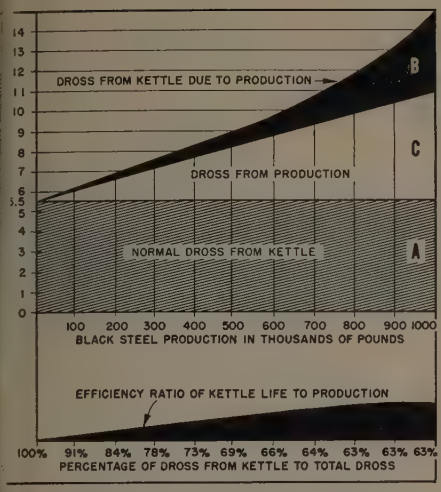

DROSS FROM KETTLE DUE TO PRODUCTION
B
C
DROSS FROM PRODUCTION
NORMAL DROSS FROM KETTLE
A
100 200 300 400 500 600 700 800 900 1000
BLACK STEEL PRODUCTION IN THOUSANDS OF POUNDS
EFFICIENCY RATIO OF KETTLE LIFE TO PRODUCTION
100% 91% 84% 78% 73% 69% 66% 64% 63% 63% 63%
PERCENTAGE OF DROSS FROM KETTLE TO TOTAL DROSS

Fig. 2—Dross Based on Month's Production

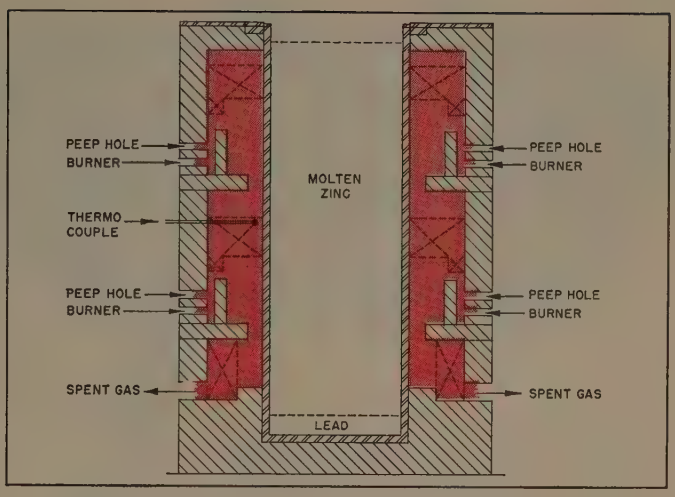


Fig. 3—Hot Dip Galvanizing Kettle

molten zinc 850°F), the temature of the inside of the kettle average only a few degrees ve the zinc temperature, say °F. At this temperature, the ditional alloying action of the el kettle over normal standing rosion can be considered negli-le.

From this point we find an area increasing solubility of iron and c, with increasing kettle wall nperature due to increasing pro-ction—in keeping with the solu-ty curve in Fig. 1.

Production—Subtracting area of ss for standing kettle and pro-ction from total dross formation, have the area of dross from oduction itself—see Fig. 2. Here stands for normal dross from tle; B, from kettle due to pro-ction; and C, from production. Area A must be considered most-in original design of equipment. ce established, dross from this urce will be reasonably uniform rough the life of the setting.

Ceramic Help—A ceramic, non-oying surface on the inside of e kettle eliminates dross from ea A, but, difficulties in appli-tion and maintenance have held from universal acceptance. How-er, from the standpoint of theory d possible future use, it would em to be a major contribution.

Other Controls—Uniform heat-g of the heat transmission area the kettle (see Fig. 3), minimum exposed surface radiation area of molten zinc and proper steel in the kettle itself contribute to low dross formation.

Area B is affected by the same consideration, plus several more. Keeping work from the sides of the kettle to cut down wash is mostly a design item. Control of production to remain below critical heat replenishment to the bath (and the holding of work above the settled dross area) does three things—it keeps zinc bath cleaner, tends to reduce dross formation and allows for better quality work.

Area C depends on cleanliness of work, speed of submersion and withdrawal, submersion time and amount of suspended dross in bath.

Inside Kettle—Inside surface of the kettle is consistently hotter and more soluble in zinc than the surface of the work. Considering dross formation, this is not desirable but would be much worse if it were not reduced by the following alloying action:

An alloy crust forms on the inside surface of the kettle which, if not washed or scraped away, deters alloying action. Work continually presents a clean surface to the molten zinc for alloying.

The Kettle — Because of the rather heavy cost of replacing a burned out kettle, kettle life is the subject of a great deal of continued study.

Composition of metal used, method of welding, annealing, construction of the setting and uniformity of heating are design items that should be given much thought.

Production schedules and methods, however, bear greatly on kettle life. From Fig. 2 we find that with no production about 100 per cent of dross formed comes from the inside surface of the kettle itself.

With uniform heating, practical life of an idle kettle at maintained temperature of molten zinc could be calculated with considerable accuracy.

Total dross increases with production, reducing kettle life. Percentage of dross from kettle to total dross reduces in this setting to only 63 per cent at full production.

Thus the kettle life is actually shortened in one sense, while in terms of tons of production, it is increased.

Beating the Pot—At a certain point in increased production, transmission of heat through the kettle wall increases the solubility of this steel in zinc to where increase in dross from the kettle rises sharply. This actually reduces kettle life in terms of production tonnage.

Either low or high production is not economical — particularly in the high area, where dross particles have a tendency to stay in suspension.

WHEN TO TREAT

No heat treatment required . . .

1. Where corrosion resistance, as welded, is adequate.

2. Where high temperature strength is the primary service requirement, and in the absence of serious stress concentrations.

3. In relatively thin weldments.

Heating of the weldment or structure to a minimum of 1750°F is recommended . . .

1. Where dimensional stability must be assured.

2. For improved corrosion resistance of the weldment.

3. Where improved mechanical properties are desired in high temperature service.

HOW TO TREAT

● Rate of heating of the weldment during the postweld heat treatment, except for very thin members, should not exceed 300° F per hour to 1100° F, above which temperature the rate should not exceed 600° F per hour. Holding time at temperature should be 1 hour per inch of thickness. For thicknesses under 2 inches, 2 hours is minimum holding time. Cooling to 1000° F from the heat treating temperature should be as rapid as practicable for the unstabilized grades.

Moderate air cooling should be used for the stabilized grades. Cooling from 1000° F may be in still air. However, in the case of heavy-walled weldments or structures of nonuniform cross section, the cooling rate should not exceed 400° F per hour divided by the wall thickness in inches.

Local heating should be done only for improvment of mechanical properties. Such local heat treatments will result in reduced corrosion resistance in the temperature transition zones for any heat treatment above 850° F.

Stress Relieving Austenitic Weldments

American Welding Society committee sets forth some important factors, along with general recommendations. There are a lot of variables to consider, but this should help

TO heat treat, or not to heat treat, has long been the question argued among welding engineers when the subject of postweld treatment of austenitic weldments has popped up. Thanks to the AWS Committee on Piping and Tubing, some recommended practices have been drawn up that should answer a lot of questions.

Problem essentially involves three important variables: Structural characteristics of the weldment, service requirements and composition of the austenitic material. The recommendations are considered to apply to austenitic steels of AISI 300 series. Temperatures other than those within the recommended ranges may be applied where experience shows that the treatment will not adversely affect the service performance of the weldment.

Structural Characteristics — Inherent rigidity of a weldment must be weighed strongly in deciding whether or not to stress relieve and what treatment should be used.

Many structures, for example thin-walled vessels (under ¾-inch wall), will not require treatment because of the relative ease of deflection and consequent low level of residual stress.

Conversely, thick-walled vessels with a high degree of restraint will contain higher levels of residual stress and will be more apt to require a stress-relief treatment. However, symmetry of the welds, thick and thin sections in combination, type of welds and whether or not loading is cyclic in nature will also influence any decision.

Other things to be considered in making the decision: Method of attaching clips, braces, saddles etc. by welding, and the design details of nozzles, heads, flanges and other pressure parts where notches or stress raisers are inherent.

Service Requirements — Austenitic materials are used for one of two purposes, or possibly both concurrently: Corrosion resistance and mechanical properties at operating temperatures. When resistance to intergranular corrosion is a requirement, use of an extra low carbon or a stabilized grade should be considered.

The recommendations in the box above are classified according to postweld heat treatment and the primary purpose or service requirement noted. There are some postweld treatments in several temperature ranges, employed to improve dimensional stability and give partial stress relief. Final decision as to use of treatments below 1750°F must take into consideration the benefits derived against possible adverse conditions created, such as carbide precipitation.

AGAIN REVERE SAYS:

"Copper is the metal of Invention!"

Few people would consider it possible to melt titanium at a temperature of 3140°F. or above in a mold made of copper, a metal which melts at 1980°F. Yet it is being done on a production basis, and is helping in the work of making titanium metal available on a commercial basis.

The secret lies in copper's high thermal conductivity. Molds made of Revere Copper by the Central Copper Works, Inc., Cincinnati, Ohio, have a Revere Copper baffle wrapped in a spiral around them. When installed in its jacket in the plant of Rem-Cru Titanium, Inc., Midland, Pa., the copper mold is connected to a source of high-velocity water. The high heat conductivity of the copper transfers heat so rapidly to the water spiraling along its surface that the copper never comes close to its melting point.

High heat conductivity is only one of the qualities that make copper "the metal of invention." Copper is also easily workable, has the highest electrical conductivity of any commercial metal, does not rust, is easily soldered or brazed, and can be welded perfectly. The Revere Technical Advisory Service will gladly collaborate on any special problems concerning the application and fabrication of copper. Just get in touch with the nearest Revere Sales Office.

Titanium ingot, 25" in diameter, 51" long, weighing 4,050 lbs., melted at 3140° F., and the water-cooled copper mold, which would melt at 1980°F. if it were not for copper's high heat conductivity. The flange on the mold is steel, welded to the copper by the inert gas shielded arc method, using silicon copper rod.

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SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

Coil of steel, having been carried safely from the pickling line, is lowered for storage prior to cold reduction operations at the Cleveland works of Jones & Laughlin. Motorized tongs can turn the coil to face in any desired direction. Tempering department has similar tongs

Motorized Tongs Simplify Coil Handling

Motor drives built into the tongs open and close jaws and provide power for turning a full 360 degrees. J&L reports faster, safer handling without malforming coils

SPECIALLY designed motorized tongs, carried by a crane high above, are adding new ease to the handling of coils of strip steel at the Cleveland Works of Jones & Laughlin Steel Corp.

Operating between the continuous pickling line and the cold reduction mill, they make the lifting, carrying, and safe delivery of coils virtually a push-button operation, saving time and insuring the safety of personnel. Controlled by the craneman from his cab, they carry coils ranging from 20 to 72 inches wide, and weighing up to 60,000 pounds, without malforming the coils or damaging their edges. If need be they can turn a coil horizontally through a full 360°.

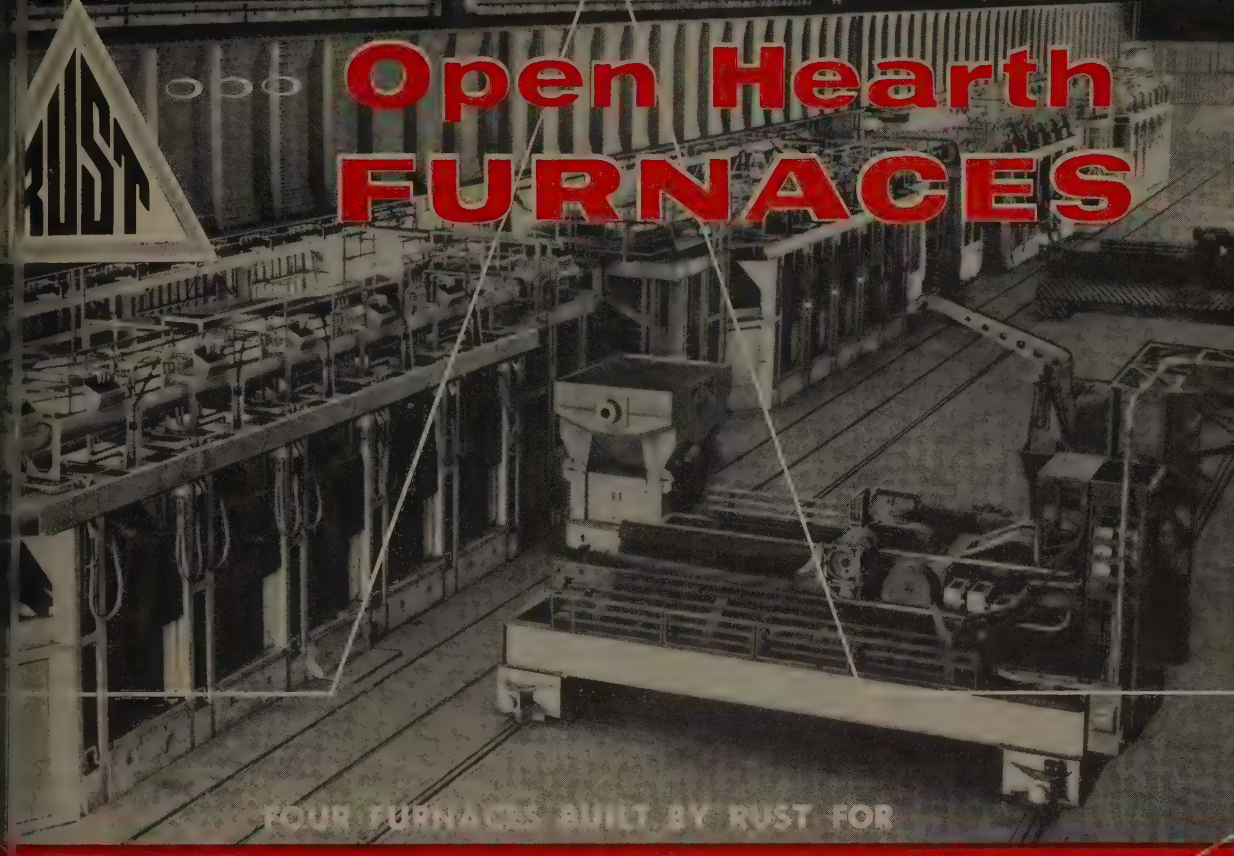
Tongs were installed as part of an extensive enlargement and modernization program at the Cleveland Works, where strip steel for automobile bodies, refrigerators, and other purposes is manufactured. In this program, the building housing the 3-stand cold reduction mill was extended to provide space for a completely enclosed pickling line and for storage of coils before and after pickling.

Equipment is Modern—Modern machinery, directed from ingenious control panels, downends the coils, uncoils them, and welds them into a single strip to be carried through a succession of pickling baths and rinses. As it emerges from the final rinse, strip is trimmed at the sides, cut into suitable lengths, and coiled.

In designing this installation Jones & Laughlin engineers sought a suitable method of lifting the coils at the end of the line and delivering them either to stock or direct to the cold reduction mill as might be required. None of the existing equipment fully met their needs.

The Problem — Overhead handling was considered desirable, to save space on the floor. Safety was an important consideration, as was

Open Hearth FURNACES



FOUR FURNACES BUILT BY RUST FOR

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Lone Star Steel Company's modern steel mill called for modern Open Hearth Furnaces and Rust is proud to have filled the need with four modern installations. In all phases of steel making, particularly today, ECONOMY is an essential for advantageous competitive position. For more than a quarter-century, economy has been Rust's keynote for efficiency in metallurgical furnaces of all types — beginning with Open Hearths. It will pay you to consult Rust for quotations on designing and building your new Open Hearths, or on redesigning and rebuilding your old furnaces.

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Rust Furnace Company

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Unloader Solves Tough Engineering Problem

A traveling unloading tower built by Heyl & Patterson Inc. solved difficult problem of loading ore directly from ship to distant river barges. It was to run on tracks already in place on dock. Space between leg of the unloader was too narrow to support weight of cantilever and bucket so it was designed with machinery house far to the rear as a counter-balance. Adjustable voltage electrical control is one new development on machine

the protection of the coils. Equipment had to be versatile enough to take coils of varying widths and husky enough to lift the heaviest coils expected to come from the pickling line. It should be speedy in operation, resembling the push-button operation of the pickling line itself. If possible, the equipment should have a turning feature for coil positioning.

Problem was referred to Heppenstall Co., Pittsburgh, whose automatic tongs are used for coil lifting at several points in Jones & Laughlin's Cleveland Works. The motorized tongs were the result.

Motor Driven — A 1-hp electric motor provides power for opening and closing the huge jaws. Another 1-hp motor provides power for turning the tongs. Both motors are contained in the rotating head of the tongs.

As the tongs are lowered, they are opened to their full width. When they are in proper position, as indicated by a signalman on the floor, the craneman starts a motor, causing the jaws to close, holding the coil in a tight grip as it is lifted. Self-locking jaws prevent the tongs from letting go until the coil is safely delivered, even in the unlikely event of a power failure. When the coil rests on a firm surface again, the motor can be reversed, causing the jaws to open.

Clutches Prevent Damage—Power from the motor is transmitted to the gears through a centrifugal clutch of Heppenstall design. This provides a flexible coupling that prevents overloading of the motor and excessive strain on the gear teeth in case the motor is allowed to operate after the jaws have opened or closed as far as they can. It also prevents excessive pressure on the coil by the tongs.

A similar clutch is used with the motor that provides power for turning the tongs.

Built-In Steeple Jack

A porcelain-coated smokestack has been developed by Seaporcel Metals Inc. and installed at the Crippled Children's Hospital, New Orleans.

Porcelain coating, according to Seaporcel, of smokestacks of industrial and public buildings will eliminate the need to paint those chimneys. Heat dries out the paint on a stack, flaking follows and corrosion sets in, necessitating repainting every couple of years. The porcelain coating means protection from corrosion and permanence of installation.

Lighter Aluminum Alloy

RECENT approval of aluminum alloy GR40A by the Boiler Code Committee of The American Society of Mechanical Engineers offers manufacturers and users of unfired pressure vessels a valuable new construction material. The alloy is designated A54S by Aluminum Co. of America.

Approval of this alloy became effective with the publishing of ASME Case 1174. This case permits the construction of unfired pressure vessels of A54S alloy in accordance with the rules of Section VIII of the 1952 ASME Boiler and Vessel Code.

Alcoa alloy A54S offers higher mechanical properties than any of the alloys previously approved for welded pressure vessels. As a result, allowable design stresses are higher. The alloy becomes even more desired for elevated temperature operation because it maintains strength better at the higher temperatures.

Welded By All Methods — Although the alloy can be welded by all conventional methods, the semi-automatic inert-gas metal-arc process and the inert-gas metal-arc process (tungsten-arc) are preferred.

While A54S is more expensive than the other approved alloys on an equal weight basis, it is more economical on the basis of equivalent strength. The weight saved in vessels fabricated from this alloy will normally more than offset the increased cost per pound, and the lighter weight in itself is often a valuable advantage.

Furnace Lining Failures

Causes of most furnace lining failures are improperly rammed cement and insufficiently vitrified facing, according to George J. Easter, research director, Electro Refractories & Abrasive Corp., Buffalo. And these, according to Mr. Easter, can be overcome easily.

Each successive portion of cement should be put into interlock with the previous portion. Then the new lining should get sufficient firing for the necessary vitrification before the furnace is placed in actual operation.

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Portable Ventilation

Air mover is placed quickly over service entry to ball mill, and compressed air line coupled to it. Mill can be ventilated before workers enter

Reversing usual procedure, while maintenance worker inspects interior of stove, air mover is pointed inward to establish steady flow of fresh air

Some of the most imposing hazard conditions are those that don't warrant full-time equipment. These lightweight air movers move in minutes to points of potential trouble

TOXIC or combustible plant gases, dusts or vapors encountered continuously or at regular intervals establish an obvious hazard where fixed ventilation equipment can be used to keep the air clean and safe. However, a sometimes more imposing problem arises when such conditions occur at irregular times and various locations. This hazard is more difficult to appreciate and combat.

At Pittsburgh Coke & Chemical Co.'s Neville Island plant, safety supervisor James J. Padovese and his associates have developed a practical solution. Basically, their preventive technique is one of taking portable ventilation to points of potential trouble, because these are too numerous and too intermittent to merit installing permanent exhausters or blowers.

Gas-Free Locations—One such location is at the blast furnace, where maintenance men working on the tuyeres, water blocks or blow pipes may be endangered by carbon monoxide that accumulates in the area. Standard procedure now is to gas-free this location before and during a maintenance job with lightweight and portable devices designed for rapid movement of large volumes of air. The MSA-Lamb Air Movers operate on compressed air or steam, have no motors or moving parts, and are carried by one man from job to job.

Air movers also are used for gas-freeing the atmosphere whenever men work in the vicinity of stoves that preheat blast furnace air. Coke oven gas is used in the stoves to heat the air to approximately 1000°F before it enters the blast furnaces, and could be hazardous.

In the boiler house, during shutdowns for maintenance or repair work on shell, drum, tubes, burners or furnace parts, use of the portable air technique not only protects employees but also saves valuable time. Men can move in more quickly and safely because the air movers can gas-free and cool the boiler and furnace more thoroughly and rapidly than by so-called natural cooling and hopeso gas-freeing method.

Checking Effectiveness — Company safety men check the air before and after use of the air movers in any ventilation-on-the-spot work at blast furnace, stove, boiler house, cement kiln or ball mill, using an MSA Explosimeter or carbon monoxide tester. The former is a compact, lightweight combustible gas indicator, easily carried and simple to operate. By setting a control and squeezing an aspirator bulb, the user can read on a meter the precise concentration of any combustible gas present, in terms of percentage of the combustible range.

The CO tester, weighing less than 8 ounces, gives precise readings of amount of carbon monoxide present in the atmosphere.

Venturi Principle—Air movers operate on the venturi principle, engineers of Mine Safety Appliances Co., Pittsburgh, mover manufacturer, explain. Either compressed air or steam is admitted to the bell and enters the horn through an annular orifice around the base. As it passes through the horn its expansion induces a rapid flow of outside air, equal to approximately ten times its own volume, through the outlet horn.

Their light weight—3-inch model weighs 6½ pounds, the 10-inch model 47 pounds—and ease of carrying also constitute substantial time-savers.

modern cinder cars for modern steel plants

speed up your cinder handling operations

Pollock's modern cinder car design is the result of 50 years' experience in building this type of car. Made for air, steam, or electric operation, Pollock cinder cars are sturdily built of all-rolled welded steel construction. Operating equipment can be arranged to dump from either side, and trucks have A. A. R. standard wheels, axles, bearing brasses and springs. In addition, special end-thrust bearings can be provided where standard A. A. R. bearings wear too fast, or roller bearings of your choice can be provided. Cars can be equipped with K brakes or AB brakes. Cars can be built to handle any size pot up to railroad clearances available or to carry two pots if desired.

Pollock cinder cars are made in various sizes, designs and capacities, and are widely used throughout the iron and steel industries. Let Pollock advise you as to the type best suited to your individual plant requirements. Write or call today for complete information.

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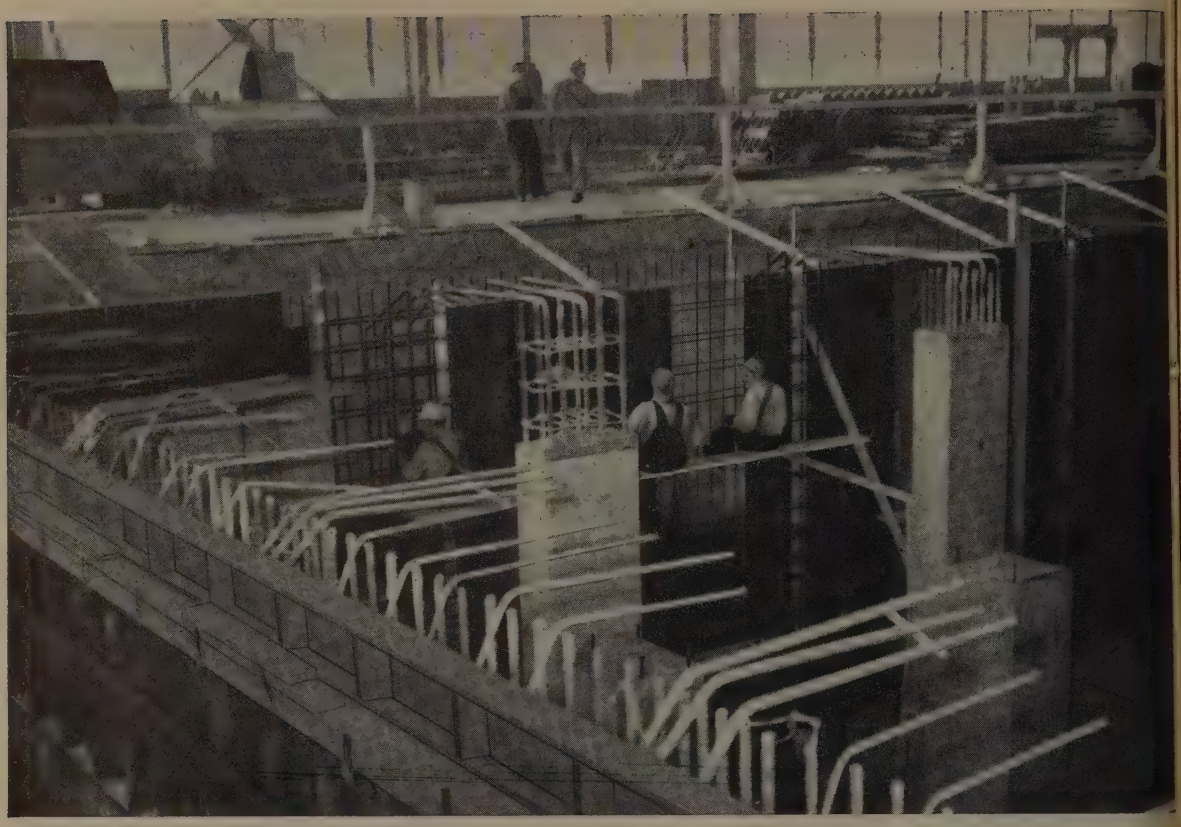

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Overhead Conveyor

Overhead assembly line brings bulky casings and other parts to assembly area

AN OVERHEAD conveyor system was developed because storage of furnace casings and liners at floor level and in quantities sufficient to support two assembly lines, required several thousand square feet of production area. To overcome the problem, Coleman Co. Inc., Wichita, Kans., tried the idea of an overhead production bank. This saves about 10,000 sq ft of floor area.

After a furnace casing has been welded, it is hooked to a conveyor

CONVEYOR LINES KEPT LONG
. . . parts come down for assembly

which carries it overhead to a transfer point. Two lines, each 800 feet in length, extend from the point where fabrication is completed to the transfer station. The lines are deliberately kept long in order to provide the space for many casings and assemblies.

Upon reaching the transfer point, an operator stationed there selects like parts or assemblies and moves them to other conveyor lines which take them in groups to the paint booths and ovens. There are four of these lines, each about 400 feet in length.

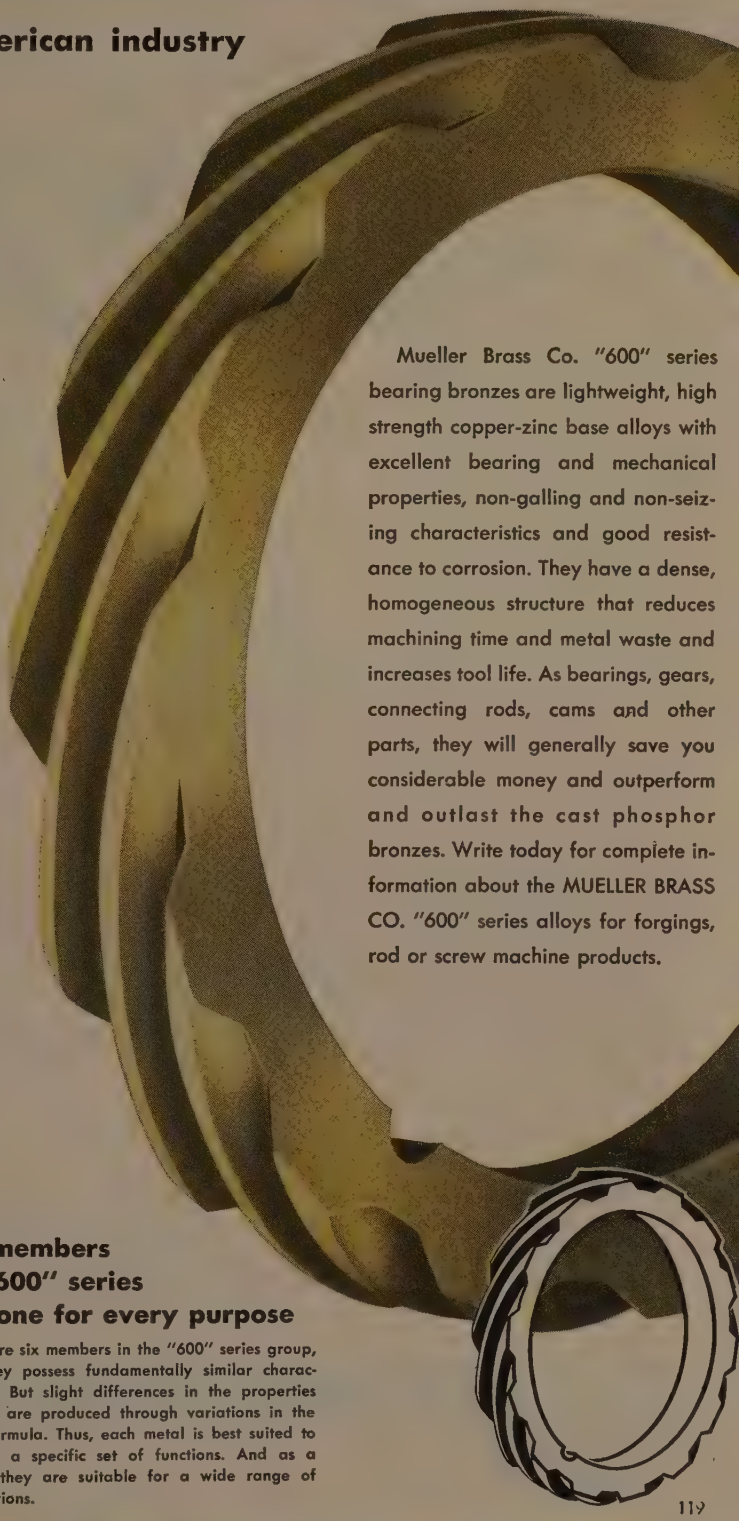
Hooked to Line—After the parts have been degreased,

MUELLER BRASS CO.

600 SERIES BEARING ALLOYS

FORGINGS • ROD • SCREW MACHINE PRODUCTS

proving their quality throughout American industry



Mueller Brass Co. "600" series bearing bronzes are lightweight, high strength copper-zinc base alloys with excellent bearing and mechanical properties, non-galling and non-seizing characteristics and good resistance to corrosion. They have a dense, homogeneous structure that reduces machining time and metal waste and increases tool life. As bearings, gears, connecting rods, cams and other parts, they will generally save you considerable money and outperform and outlast the cast phosphor bronzes. Write today for complete information about the MUELLER BRASS CO. "600" series alloys for forgings, rod or screw machine products.

six members of "600" series . . . one for every purpose

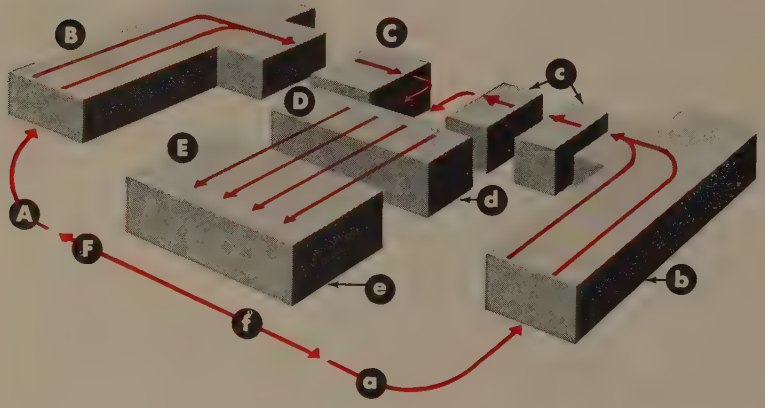
There are six members in the "600" series group, and they possess fundamentally similar characteristics. But slight differences in the properties of each are produced through variations in the basic formula. Thus, each metal is best suited to perform a specific set of functions. And as a group, they are suitable for a wide range of applications.

119

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

Heat Treat Furnace Layout

by Holcroft ...6th of a Series



A. Load
B. 2-row continuous atmosphere carburizing furnace
C. Oil quench
D. 4-row washing machine
E. 4-row draw furnace
F. Unload

a. Load
b. 2-row continuous atmosphere carburizing furnace
c. Salt bath quench and air blast cooling station
d. 4-row washing machine
e. 4-row draw furnace
f. Unload

How to Beat Heat Treat Costs!

Here's a furnace layout which is tricky—yet functional; one which steps up production—yet is flexible enough for different cycles!

Holcroft designed it to handle a variety of transmission parts requiring different processing cycles. In one case, parts are carburized, oil quenched, washed, and drawn. In the other, the stock is carburized, quenched in a salt bath, cooled with an air blast, washed, and drawn. The wash machine and draw furnace, though common to both cycles, are electrically independent.

While production flows at a rapid pace, the battery is so automatic that only a two-man crew is required for loading and unloading—one man on each side!

This is the type of furnace engineering that pays off in lower heat treat costs *to you!* And it's available on simple single-furnace jobs, or complex multi-furnace installations. It will pay you to write for more information—today! Holcroft & Company, 6545 Epworth, Detroit 10, Michigan.

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washed, bonderized, dried, dipped or sprayed, and finally put through the drying ovens, parts and assemblies are returned to the transfer point. The operator then takes the finished part and hooks it on to one of six storage type conveyors which feed the main assembly lines on the production floor.

All six conveyors are controlled from the production floor. This enables assembly line workers to call up finished parts and assemblies as they are needed. Six feed lines and two 800-foot collection lines will accommodate 400 furnace casings and combustion chambers.

The lines serving this particular factory unit and those which connect it with the finishing system would, if joined, stretch over 6000 feet. Normal operating speed of the collection lines is about 8 fpm but the speed can be reduced to as little as five fpm or increased to 25 fpm. Setting depends somewhat upon the size of the units being carried and the degree of complexity in assembling the product.

Machine to Reclaim Oil

A new device, for reclaiming oil that may have been used in one or more manufacturing processes and thereby served its purpose, has been perfected and is now available from Simplex Valve and Meter Co., Philadelphia. Known as the Oil Skimmer, the unit operates from the liquid level in a chamber through which the waste is flowing. The manufacturer claims that large quantities of valuable oil, that otherwise would be lost, can be saved through utilization of the device.

The skimmer will automatically and constantly skim oil from liquid surfaces regardless of the liquid levels in the collection tanks or chambers. It has numerous applications in different industries and can be applied wherever the reclamation of oil exists. It is of particular significance since it plays a part in the anti-river pollution programs being conducted by many state authorities. The unit provides a means of prevention of oily waste discharge into rivers and streams.

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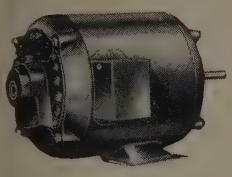


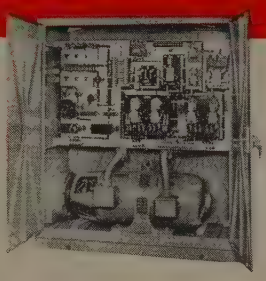
SINGLE PHASE:

Split Phase Induction—⅛, ¼, ⅓ H. P.

Capacitor—⅛ to 20 H. P.
Repulsion start, brush lifting, induction—½ to 7½ H. P.

Write for Bulletin Nos.:

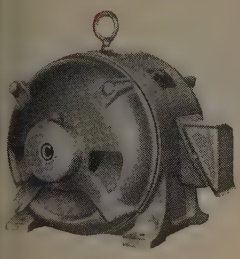
Split Phase 1-5P1
Capacitor 1-1P3
Repulsion Start 2-1P1



SELECTIVE SPEED DRIVE:

A complete line of adjustable speed drives for coordinating all kinds of production processes.

Write for Bulletin No. 11-1P1



POLYPHASE:

Squirrel Cage Induction—⅛ to 400 H. P.

Wound Rotor Motors—1 to 400 H. P.

Synchronous Motors—20 to 150 H. P.

Write for Bulletin Nos.:

Squirrel Cage, Drip Proof—6-1P1
Squirrel Cage, Splash Proof—6-1P3
Squirrel Cage, Enclosed Fan Cooled—6-1P41
Squirrel Cage, Explosion Proof—6-1P45
Wound Rotor—6-3P1

GEAR MOTORS:

⅛ to 15 H. P., single, double and triple gear reduction.

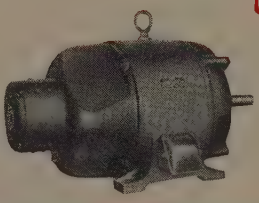
Write for Bulletin Nos.:

⅛ to ¾ H. P. . 4-5P21-61
1 to 15 H. P. . . 4-1P31

DIRECT CURRENT:

All capacities—⅛ to 300 H. P.

Write for Bulletin No. 10-1P1



GENERATORS:

AC, .63 to 250 KVA
DC, .75 to 200 KW

Write for Bulletin Nos.:

AC, .63 to 250 KVA—18-1P21
DC, .75 to 200 KW—18-1P1

CE-825R

Motors listed above are available in Open Rated Drip Proof, Splash Proof, Totally Enclosed Fan Cooled and Explosion Proof frames—and with a dozen different methods of mounting. They are unusually quiet starting and running and unusually free from vibration.

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The E. W. FERRY SCREW PRODUCTS, Inc.

Smith Road, Berea Post Office, Brookpark, Ohio

Simplified Drum Handling

SPECIAL drum up-ender device permits trucks to lift and carry drums and also to dump contents into large vats. Lewis Shepard, Watertown, Mass., designed and manufactured this device to fill a special need of one of their customers.

One man and truck complete the entire operation. Fork arms are adjustable hydraulically, enabling drums to be clamped securely. The

UP-ENDER FOR TWO JOBS
. . . drums carried and dumped

operator controls the clamping action from his driving position, adjusting the fork spread to accommodate any drum or barrel size. This part of the attachment is a modification of Lewis' standard hydraulically adjustable clamping forks.

Dumping Too — In addition to raising and transporting the containers, it was necessary to devise a way of dumping contents of the barrels into large vats. A hydraulically-controlled pivot was added which tilts the container 150 degrees forward. All of these motions—clamping, lifting and dumping—are controlled by the operator from his driving position.

Pin Head Lamp

Engineers at Westinghouse Electric's Lamp Division have developed a lamp as small as the head of a pin. Designed for use in missile tests, it aids in timing photographic records of missiles in action. Fifty

the slim-tube (1/20th of an ch in diameter) lamps are arnged alongside a strip of 35 mm otion picture film occupying a ace less than three inches long. The lamp produces a 1/40th of a att glow from a gap 1/25th of an ch long between two tiny elecodes, each only 3/100th of an ch in diameter. The slim glass linder which encloses the lamp about an inch long and contains, addition to the midget electrodes, trace of neon, a rare gas.

lectrically-Cured Bottoms

America's 2,100 mothball-fleet essels, harbored at Wilmington, N. ., are electrocuted to keep their ottoms from rusting.

Maritime Administration officials ere faced with the problem of orrosion when General Electric enineers suggested a cathodic proection, using metallic rectifiers. lectrodes were submerged in the ud along the bank of the river nd connected to on-shore rectiers (convenient for servicing and iring).

The rectifiers set up a d-c voltge between the submerged portion f the ship and the water. The reulting circuit prevents corrosion t approximately one fifth the cost f other maintenance means. Utilation of this method is expected o save the government nearly 1500 per year per ship.

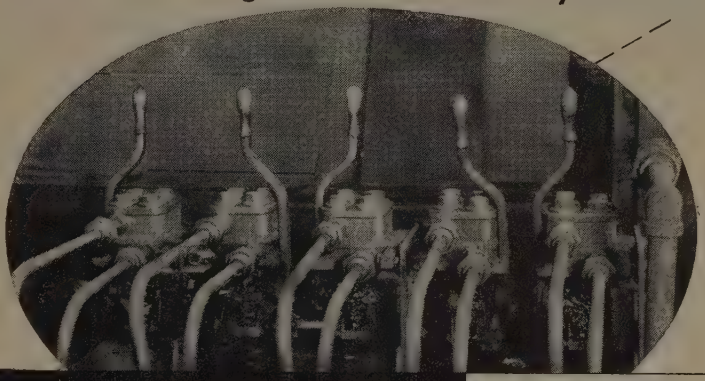
itanium Bolts Developed

Light-weight, high-strength tianium bolts of six types, primarly for use in airframe and aircraft ngines, have been developed after wo years of research and experient by Standard Pressed Steel o.

Because of titanium's high corosion resistance, in addition to ts light weight, such fasteners, ays SPS, are expected to be used n other industries, such as the hemical industry, as well as in he construction of aircraft.

The new bolts are in two lines f flush head shear bolts, two ines of internal wrenching tenion bolts, a line of external hexgon shear bolts and one of externl wrenching tension bolts. Sizes re No. 10¼, 5/16, ⅜, 7/16, ½ nd ⅝ inch.

You'll have fewer shutdowns due to damaged valve seats if you use



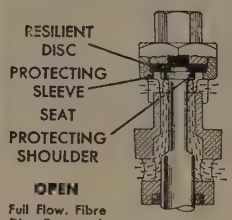
HOMESTEAD
Protected Seat
HYDRAULIC
OPERATING VALVES

They give Longer, Low Cost Service

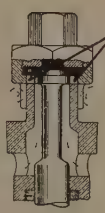
Production stoppages, due to damaged seating elements, are practically eliminated by the exclusive "Protected-Seat" built into every Homestead Hydraulic Operating Valve.

Protection against "wire drawing" or "cutting" of the seat is provided by a closely fitted protecting sleeve and stem shoulder which surround the metal seat and resilient disc in such a way that fluid-flow is all but shut off while the seat face and disc are still widely separated. With velocity thus reduced to almost zero, the most frequent causes of leakage and resultant shutdowns are eliminated. Grit, or other foreign material in the line is usually absorbed by the disc without damage to the valve seat. Records of 18 months continuous maintenance-free service are common.

HERE'S HOW THE PROTECTED SEAT *WORKS*

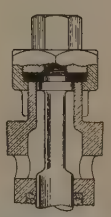


OPEN
Full Flow. Fibre Disc Protected.



Large space to reduce velocity to practically zero. This ring of water is squeezed out in closing—cushions seating.

CLOSING OR OPENING
Flow practically stopped by close fitting sleeve and stem shoulder, before seat and disc make contact. This prevents wire drawing. Trapped water cushions closing.



CLOSED
Protected resilient disc against metal seat assures drop tight performance, long life, accurate control, and low maintenance.

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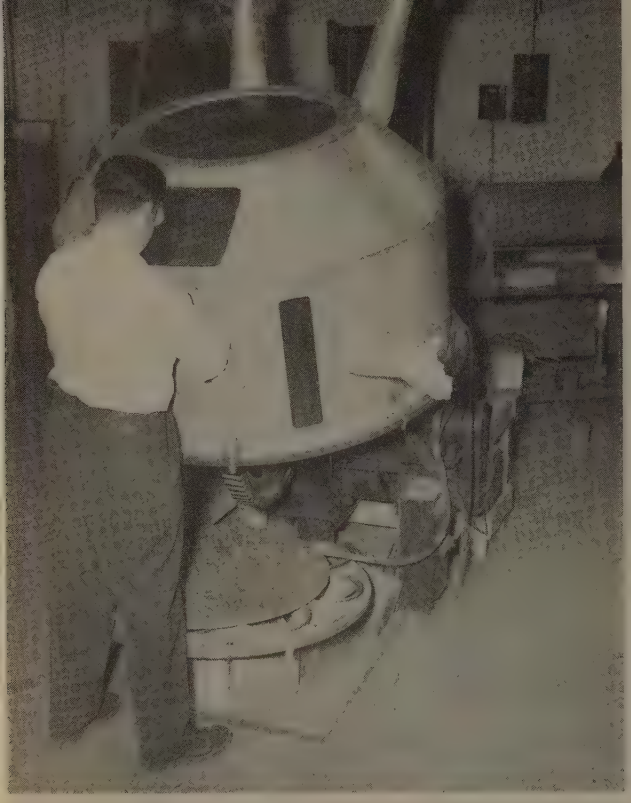
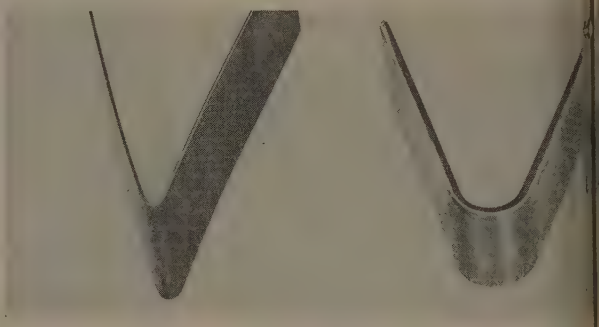
CITY.....STATE.....



Left: Operator is welding inside sealed, inert-ga filled tank that is clamped to the base of a standar welding positioner. Gas pressure forces glove-seals ou

Right: Welded with ease in the helium chamber, le to right are the following: A 0.188-inch sheet lap welde to 1 x 1½-inch bar stock; 0.188-inch sheet fill welded to the same size bar stock; corner bead wel of two 0.140-inch sheets; fillet and bead welded bo section made of 0.140-inch and 0.188-inch RC-70 she

Below: Bend test samples of RC-70 welded in chambe



Titanium Welding

For the more intricate welds, it's easier to put part and welding gun in inert-gas tank than use conventional methods. Rig isn't very costly, either

WELDING of titanium presents a variety of problems not generally encountered by metal fabricators. Shielding the weld and its adjoining parent metal from the atmosphere while both are above 1400° F is a must, since the titanium reacts with the oxygen and nitrogen to become embrittled.

Common practice has been to use one of the inert gas-shielded welding methods which flood the area with an atmosphere—excluding gas such as argon or helium. But two engineers at I.T.E. Circuit Breaker Co., Philadelphia, have developed another method. They weld inside an inert gas chamber that closely resembles a hospital incubator.

Easy to Build — Chamber, as shown in the photograph, is constructed of mild sheet steel. Shoulder-length rubber gloves sealed to the walls of the chamber permit the welding operator to manipulate the work and welding tools from the outside, while windows, made of ultra-violet-absorbing plexiglas, serve as viewing ports for the operator and observers.

Torch, cables and hoses are introduced to the chamber through gas-tight connections, and a double seal gas lock is provided so that small tools and parts can be inserted or removed from the chamber without breaking the seal. Entire chamber is sealed to the table of a conventional welding positioner allowing it to be conveniently rotated through 360 degrees and tilted through 90 degrees.

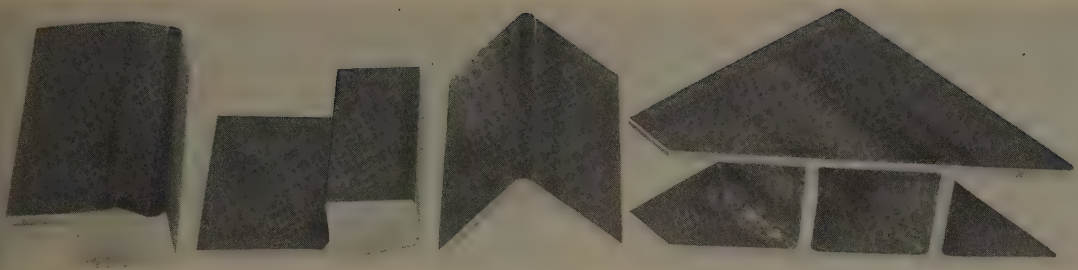
How It Works—Welding within a chamber of this kind is not a complicated procedure. Parts, fixtures, and tools required are preplaced on the positioner table in as convenient a location as possible.

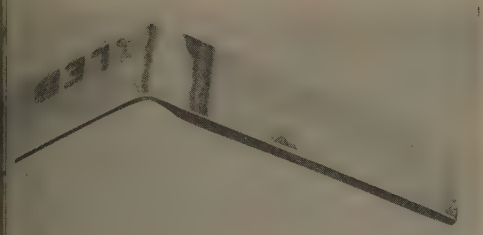
Inert gas atmosphere, usually high purity helium, is introduced at the top of the chamber and quickly displaces the air through an open purging valve at the base of the chamber. This purging is continued until an uncontaminated weld bead can be made on a piece of scrap material. Freedom from oxidation is indicated when bead is bright and silvery in color.

Generally speaking, conventional inert arc techniques for the stainless steels are applicable to the welding of titanium when performed in the inert gas chamber.

Some Exceptions — There are however, several exceptions:

1. Fixture should provide maximum accessibility and permit easy viewing of the joint from as many positions as possible. In addition, copper chill bars should be used whenever possible to restrict the size of the heat-affected zone, and to decrease the length of time parts remain at elevated temperatures.
2. Shielding of the nonconsumable electrodes by the torch gas is not important because of the completely inert atmosphere and, therefore, long extensions and unusually





IN A TANK

shaped electrodes can be used to improve accessibility when welding intricate parts.

3. Positioning the work in a horizontal plane is somewhat more important with titanium because of the exceptional fluidity of the metal when molten. This characteristic low surface tension also increases the tendency toward undercutting and bridging of small gaps so that more care is required on the part of the operator.

Properties—Fusion welds made n commercially pure titanium exibit excellent properties when roper protection from oxidation as been provided. Failures during esting of butt welded joints take lace in the parent material while ll-weld-metal specimens have hown elongations of about 22 per ent in a 2-inch gage length—approximately equivalent to that of he parent material in the as-received condition.

New Titanium Alloy

TITANIUM base alloy that is weldable and has higher strength at temperatures above 900° F than their RC-130-B is the latest to be announced by Rem-Cru Titanium Inc., Midland, Pa. Designated A-110AT, the new alloy should be a natural choice for welded rings, compressor blades and all parts requiring maximum elevated temperature strength.

This single-phase, all-alpha grade represents the first commercial production of a titanium alloy containing appreciable quantities of tin. This element improves the hot workability of the alloy and acts to broaden the range of temperatures over which A-110 can be forged.

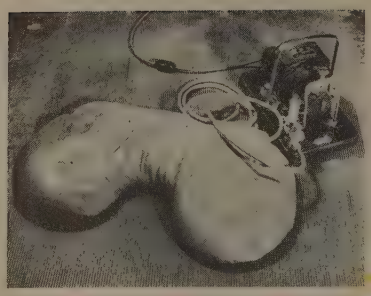
Properties—The 2½ per cent tin in A-110, together with the 5 per cent aluminum content, provides excellent toughness, fatigue strength at elevated temperatures and machinability. In addition, the alloy is readily weldable.

Alloy is available in production quantities in the form of billets, bars, plate and sheet in thicknesses over 0.1 inch. Light gage sheet and wire are in the experimental stage of manufacture. It is recommended for all welded applications requiring a material with higher strength than is provided in RC-70; particularly where some sacrifice in bend properties is permitted.

Data sheets covering the properties and characteristics in more detail are available from the company upon request.

Titanium Checklist

STEEL published a complete list of the various annealed titanium and titanium alloys, and who makes them, in the issue of October 12, 1953, on page 170. Chart gives mechanical properties for all then-known alloys, as reported by the various producers.



Complete Flexi Cast equipment consists of thin-walled rubber bag of plastic granules and portable pump

The bag, after air has been partially evacuated, becomes pliable and can be molded to any desired shape

After more complete evacuation, bag becomes rigid, maintaining its molded shape to position parts for X-ray

X-Ray Inspection

Plastic Positioner Fits Irregular Parts

Introduced for medical x-ray application, this plastic bag assembly has developed into a new tool for fast and inexpensive inspection of small shapes

By E. R. FOOR
Metallurgist, Solar Aircraft Co., Des Moines, Iowa

IN RADIOGRAPHY of jet engine components, problems continually arise in handling parts of greatly varying size, shape and weight. Considerable blocking and haphazard jigging is required in setting up and preparing parts and films for x-ray exposure. Result is not only a lengthy and laborious setup process, but a repetition of the procedure for every part x-rayed.

A few jigs and fixtures that would adequately lend themselves to such a variety of parts are nonexistent and would be practically impossible to design economically.

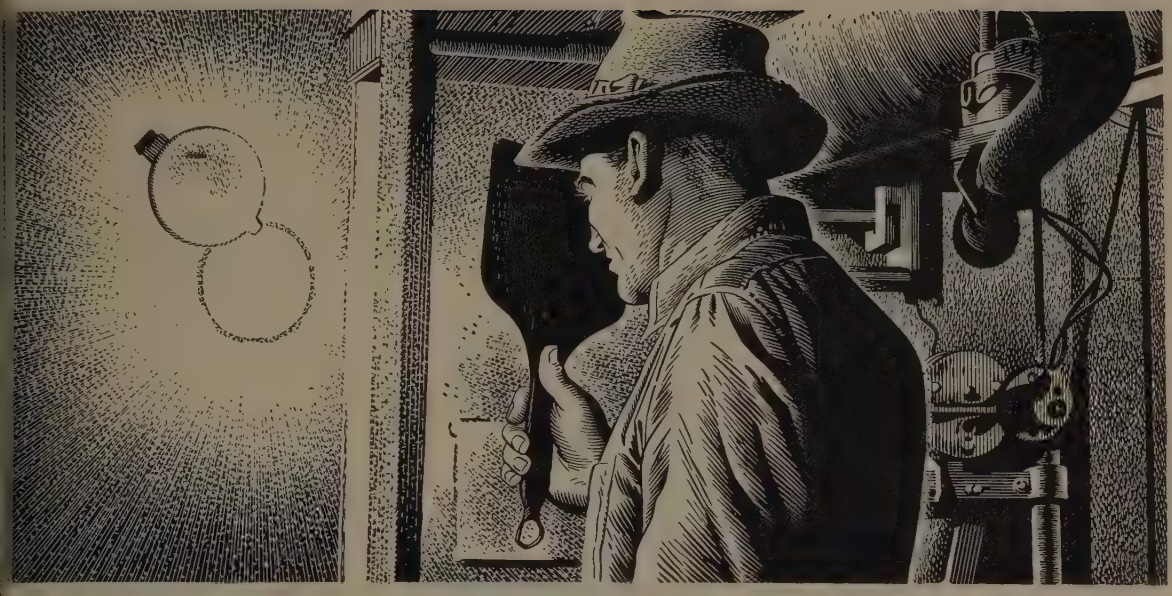
Problem of Small Parts — Jigs and fixtures for holding parts like flanges, welded rings and cases are readily available and have proved satisfactory in production x-ray sequences. However, the problem of jigging for x-ray lies not in holding these parts, but in holding smaller units of irregular shape while x-ray exposure is completed. It is in jigging the latter type part that Solar Aircraft Co.'s new Flexi Cast has proved most useful.

The equipment was developed for medical x-ray applications. However, during a demonstration, possibility of valuable industrial x-ray potential was seen. Picker X-ray Corp. lent the equipment to our experimental x-ray laboratory for development and experimentation.

Any Desired Shape—The equipment is simple to operate, inexpensive, and requires no special training or skill on the part of an x-ray technician. Flexi Cast is the name for a thin-walled rubber bag filled with fine plastic granules. Attached to the bag is a flexible hose through which air can be evacuated by a portable electric vacuum pump.

In its natural state, the bag is very limp. When air is partially evacuated from the bag, it becomes as pliable as putty and can very easily be molded to any desired shape. Upon further vacuumization, the bag and its contents become as hard as a rock, holding any previously molded shape. It is this unique property of freezing when vacuumized that makes Flexi Cast valuable for use in x-ray setup.

Because there is a point during air evacuation at which the bag becomes pliable so it can be shaped to any desired configuration and because the bag can be hardened in this particular shape, it can be made to serve as a universal jig and fixture. As a universal jig, Flexi Cast not only holds the part



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ONTROL OF EXCESS AIR BY CITIES SERVICE HEAT ROVER CAN REDUCE HEAT LOSSES AT CEMENT LANTS! In cement kilns, air must be controlled to e precise quantity that will just completely burn the el. Any excess of air above this amount carries aste heat out of the kiln. THE HEAT PROVER ENABLES HE OPERATOR TO SEE WHEN THE RIGHT AMOUNT F AIR IS ENTERING THE KILN.

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BUT THE CITIES SERVICE HEAT PROVER CAN!

CITIES SERVICE

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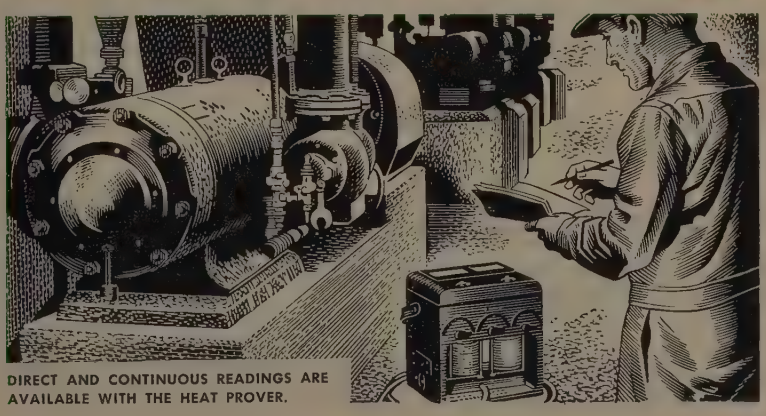
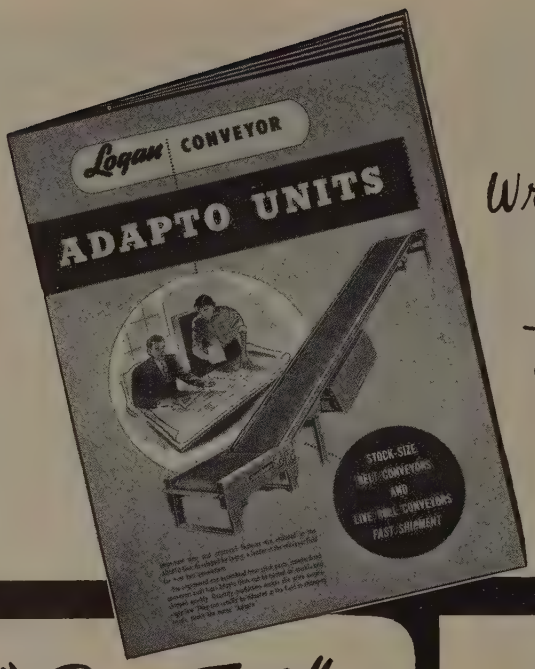


DIRECT AND CONTINUOUS READINGS ARE AVAILABLE WITH THE HEAT PROVER.



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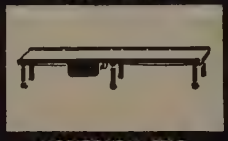
INCLINED BELT CONVEYOR


HORIZONTAL BELT CONVEYOR

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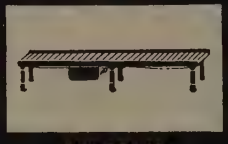
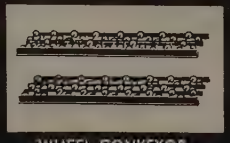
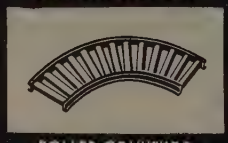

LIVE ROLLER CONVEYOR

ROLLER CONVEYOR STRAIGHT SECTIONS

WHEEL CONVEYOR CURVED SECTIONS


WHEEL CONVEYOR STRAIGHT SECTIONS


ROLLER CONVEYOR CURVED SECTIONS

in position under the x-ray head, but also holds the film in place against the part.

Transparent to X-Rays—Use of Flexi Cast as an x-ray jig is simple. First, enough air is evacuated from the bag to make it pliant. Then, it is molded into position under or around the part to be x-rayed. At this point, film in its flexible holder is inserted between the Flexi Cast bag and the part. More air is evacuated, and the bag hardens.

Part with film in proper position on the part will now be held firmly in place for x-ray exposure since the bag will relax only when air is allowed to enter it. Radiography can be performed through the bag without difficulty since the bag and its plastic contents are transparent to x-rays.

One-Sequence Inspection — In most cases, the Flexi Cast bag can be molded so one shaping and evacuating sequence will suffice for radiographic inspection of any number of like parts. For this kind of operation, the bag is kept in its molded and hardened state while x-rayed parts are removed and parts waiting inspection are placed on it. This practice eliminates setup time for all but the first part x-rayed.

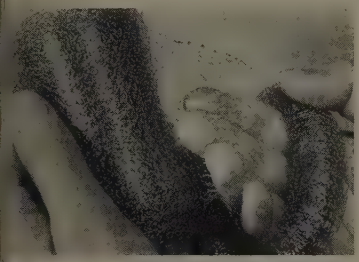
Molder and frozen Flexi Cast is supporting a part and holding film holder in place. No props are required

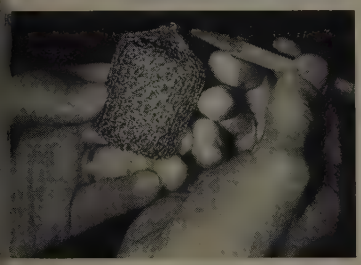
In one experiment, we found that one man using this technique trebled his output of radiographed parts for a 4-hour period.

Equipment used in all development work was the regular medical type. However, Solar reports it is prepared to turn out special bags for industrial application and plans further changes to up versatility.

lew Jobs for Stainless

EW and varying industrial applications are constantly being und for precision stainless steel ire. Fort Wayne Metals Inc., ort Wayne, Ind., reports a new ecification form which gives oduct design, engineering and rchasing departments a definte eans of specifying wire requireents. As an aid to present and otential wire users, the form covs all known stainless steel wire bjects, suggests uses and simplies buyer procurement problems.





One of the latest uses for stainess wire made by them is in prouction or shock absorbers for lectronic equipment.

Designed and manufactured by obinson Aviation, Teterboro, . J., this new cushioning element tilizes specially hardened stainss steel wire first knitted into sleevelike mesh. The mesh is hen flattened, rolled and comressed to the proper density, after hich the cylindrical roll is enlosed in a single sleeve of finely nnealed wire mesh and inserted n a stainless steel coil spring.

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When sheets are ordered by gauge number, permissible A.I.S.I. thickness variation is plus or minus 10%. Thus, if you order standard 18 gauge 36"x 120" stainless sheets you may receive .052" thickness—while your job might actually require about .0475". And in the matter of weight, the theoretical weight of this same standard sheet is 63.00 pounds—but it may permissibly vary between 59.22 and 65.52 pounds. Remember, you purchase sheets *by weight*.

MicroRold Stainless may be ordered rolled to the "light side" of the gauge range. MicroRold Stainless may be held within a 3% tolerance—with such micro-accuracy that you are assured constant uniformity throughout your sheet or strip. And since each one-thousandth inch saved in thickness saves 1.26 pounds per sheet, MicroRold's amazing thinness control may well save you money.

Ask your steel warehouse distributor about MicroRold Stainless.

Washington Steel CORPORATION

WASHINGTON, PENNSYLVANIA

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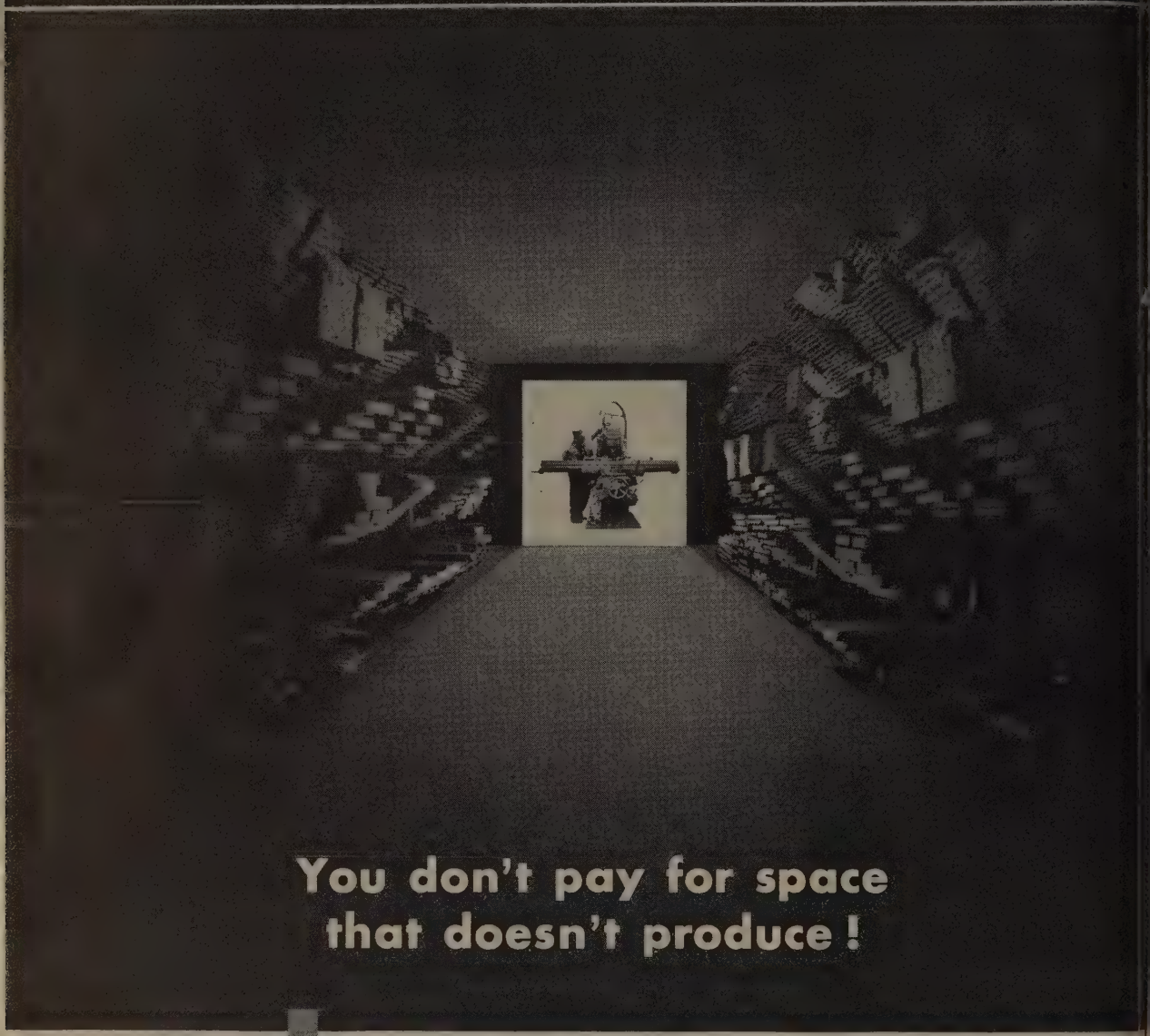

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- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

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NEW PRODUCTS and equipment

Reply card on page 125 will bring you more information on any new products and equipment in this issue

arbide Tool Grinder

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A 6-inch, dry-only carbide tool inder, model D-6, is equipped ith a safety cup disc (patented) hich completely fills the open cup

the wheel. It prevents hand in- ries and dropping a tool into the t of the wheel. The grinder is uipped with exhaust type wheel ards.

To compensate for wheel wear, bles adjust in and out by means screw feed. Wheels are quickly d easily changed. Two operators n grind tools at the same time ith freedom of movement and un- structed vision. Hammond Ma- inery Builders.

R MORE DATA CIRCLE NO. 1 ON REPLY CARD

rret Lathe

. . . with increased power

Warner & Swasey announces a ne of heavy duty saddle-type tur- t lathes. The new machines fol- w in size the company's pres- nt 1A, 2A, 3A and 4A lathes, nt incorporate important design anges: Increased power, en- ling faster removal of metal; a ider range of speeds, permitting better adjustment to the requirements of the work to be done; automatic gear shift controls, which provide easier, faster and more efficient operation.

They are designed to reduce manufacturing costs by providing proper horsepower at proper speeds for maximum metal removal, increasing flexibility and adaptability of operation, lessening the operator's effort and assuring quality of output by further automatic controls. Warner & Swasey Co.

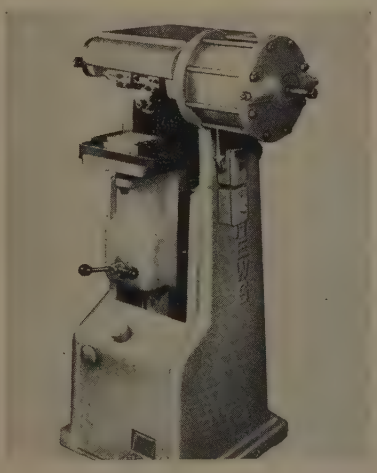
FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Marking Machine

. . . air-hydraulic table lift

Matthews has engineered a machine for use in various industries for marking different shaped products.

It facilitates production marking on materials usually damaged



by previously existing equipment. Air-draulic machine rolls permanent impressions, from a single character or trade mark to several lines of lettering 3½ inches long, on parts up to 6 inches in diameter.

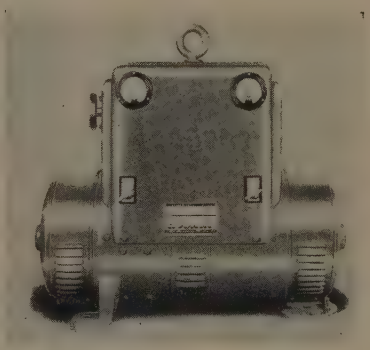
Furnished with special fixtures for holding different shaped parts, the model 240 features a combination pneumatic-hydraulic table lift which raises the unmarked part in contact with the face of the marking die. Installation is simple, requiring only the attachment of a 70-100-psi air supply line. Jas. H. Matthews & Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Arc Welder

. . . in three capacities

An arc welder, especially designed for welding with inert-gas-shielded-arc, the submerged arc



and other automatic processes, is equipped with a hand wheel on the side of the control cabinet which lets the operator set the machine for desired arc voltage. The arc voltage then remains constant regardless of the amount of current being used.

It is available in 3 rated capacities of 400, 600 and 900 amperes for operation on electric power supply of 2 or 3 phase, 60 cycles, 220/440 voltage (dual) or

for 550 volts (single). They can also be supplied, at a nominal extra price, for 50 cycles or 25 cycles, as well as direct current supply of 115 volts, 230 volts, or 550 volts. Hobart Brothers Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Angle Computer

. . . measures any angle

The Derry angle computer measures in degrees and minutes any angle, simple or compound.

Developed after years of research, this high precision tool is a definite aid where accurate measuring of angles is important. The

design of the angle computer is such that the job is always on the center of gravity, eliminating any tendency to sway or sag. It is rugged enough to handle light machining, mill cuts, grinding and drilling operations. Scientific Engineering Co.

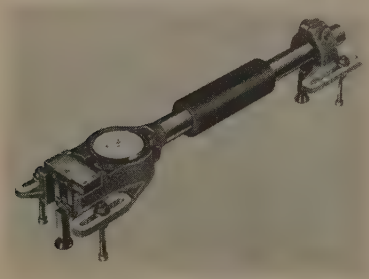
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Shallow Bore Gage

. . . easy diameter, height setting

This OD gage is designed especially for gaging shallow bores and/or shoulder diameters.

Model 88 P-10 gage features



easy adjustment to suit your diameter requirements and locating buttons which can be adjusted for height so as to locate the measuring contacts at the desired elevation. It has a tubular frame, is light in weight and easy to handle with either one or two insulated hand grips.

The model has been designed so that gages can be made up from stock parts, assuring prompt delivery. Federal Products Corp.

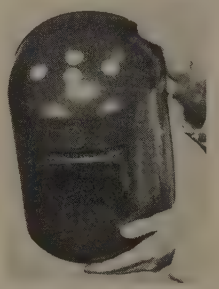
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Plastic Welding Helmet

. . . for safety and comfort

A lightweight and strong plastic helmet has been designed for cooler welding and prevention of lens fogging. The plastic shell is heat-resistant, moisture-proof and nonwarping.

The headgear is designed to fit the contour of any head. Wider range headsize adjustment is provided by a ratchet-type device and a four-position stop meets vertical and overhead needs. It is available



in a durable black finish with or without a flip front. Respective weights of the two models are 29 and 25 ounces. General Electric Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Two-Piece Pinch Jaws

. . . centers without distortion

Work can be accurately positioned and centered without danger of distortion or change of position with Cushman's pinch type chuck and face plate jaw. The jaw

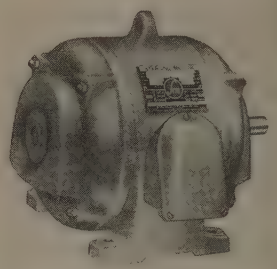
can be mounted on face plates, milling machine or jig boring machine tables. Because of the two-piece jaw construction, it may be used with soft blank-top jaws machined as required for special workholding applications. Cushman Chuck Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Electric Motor Line

. . . smaller, more compact

The availability of the advanced design Klosd normal speed electric motors, in frame sizes of 182 to



184 is announced. These new smaller motors incorporate NEMA approved standards. In accord with these requirements, Sterling engineers have designed a streamlined compact drive which is fully protected and actually excels in performance and durability.

According to the manufacturer, the new motors feature more horsepower in less space, new terminal boxes, greater bearing protection, protected construction and improved insulation.

The 182 and 184-frame sizes in production are the beginning of a complete changeover in the line to incorporate the NEMA standards. Sterling Electric Motors Inc.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Cam Clutch Units

. . . act as backstop

Morse Chain offers a cam-type one-way clutch unit designed to

serve as backstop (anti-rotation) indexing and overrunning clutch in

THE

Delpark Junior

BRINGS

Greater Savings

TO MACHINES WITH 1/4 TO 1 1/2 G.P.M. COOLANT FLOW

Greater savings through better finish, greater accuracy and more production are possible with the DELPARK Junior Coolant Filter on machines with low coolant flows.

Newest in a famous line, the DELPARK Junior now brings to the machine with small coolant flow, individual filtration with all the efficiency of the larger DELPARK Automatic Filter.

SAVINGS? . . . There are savings in the low cost DELPARK Junior . . .

—*Savings* in greater accuracy and better finish through free-cutting wheel or tool action . . .

—*Savings* in greater machine efficiency and production . . .

—*Savings* in labor and material . . .

—*Savings* in rejects . . .

—*Savings* in grinding wheels and tools . . .

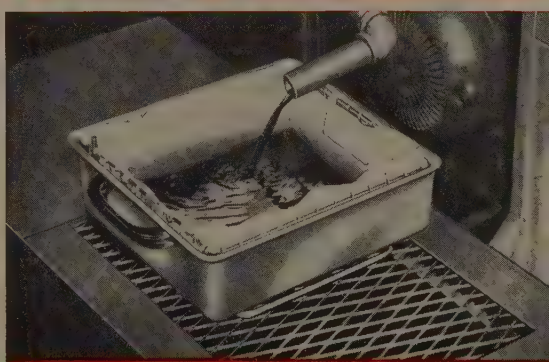
—*Savings* in maintenance and machine parts . . .

—*Savings* in coolants . . .

—and *Savings* in numerous other production and operation phases.

Write today for the new DELPARK JUNIOR BULLETIN.

Delpark Junior installation on gear hobber. Coolant flows through tray and returns to machine through lower pipe



Delpark Junior serving small grinder. Unit rests on top of coolant tank and releases filtered coolant into reservoir

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Rods

a wide variety of machine drives.

Known as 200 series, these units are made with OD dimensions and tolerances corresponding to seven sizes of standard 200-series ball bearings. The clutches have no inner race; the full complement of cams bears directly on a hardened shaft surface. Individual clutch units can be mounted in a machine housing bore adjacent to the ball bearing supporting the shaft on which clutch acts. Morse Chain Co.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Magnetic Coolant Separator

. . . for all machinery types

A magnetic coolant separator for removing magnetic contaminants from the coolant used with practically all types of metalworking

machinery utilizes Alnico non-electric permanent-type magnets to separate magnetics from the coolant. These magnetics adhere to the drum surface of the separator, forming brush-like clusters that sweep out many non-magnetic particles.

Advantages claimed for the new Dings separator include: Longer tool and wheel life; fewer rejects; elimination of downtime for cleaning coolant; less coolant loss; low operating and maintenance costs. Easily installed. Dings Magnetic Separator Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

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NFORMATION

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ig Line Guide

Cannon Electric—A publication been issued by Cannon to pro- e an orientation guide to their of plugs, which consists of oroximately 18,000 different ns. The guide also serves as index to the several Cannon en- neering bulletins from which a ticular plug or receptacle can ordered by number. 23 pages, y illustrated.

MORE DATA CIRCLE NO. 12 ON REPLY CARD

inless Library

Armco Steel Corp.—A 4-page der describes Armco's stainless el library. Included is a 44- e general catalog; booklets on inless steels for heat resist- e; the ELC stainless types; ra thin-gage stainless and a nber of others.

MORE DATA CIRCLE NO. 13 ON REPLY CARD

w-Cost Fume Removal

J. S. Stoneware Co.—The Proc- Equipment Div. offers Bulletin -3 describing and illustrating Cyclonaire portable fume sher for low-cost fume removal plants and laboratories. Com- te technical data, drawings, formance charts and dimen- nal information on the compact sher make this a helpful book- for all engineers concerned h fume removal problems.

MORE DATA CIRCLE NO. 14 ON REPLY CARD

olosion Chamber

Tenney Engineering Inc.—Spec- ations of Tenney's new explosion mber are listed in a 4-page bul- in. Construction details and cial features are given along h step-by-step procedure for ting equipment in the chamber, s information on the specially- nstructed chamber door, pres- sure relief system, vacuum line controls, safety valve system and automatic and manual controls.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Emergency Lighting

Electric Storage Battery Co.—A 4-page pamphlet is designed to assist in selection of emergency lighting equipment. Schematics, layouts and illustrations of typical installations are supplemented by suggested specifications conforming with sections of the recently revised National Electrical Code dealing with 6-volt emergency lighting equipment.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Steel Stock

J. L. Cunningham & Co.—Latest technical data on new steels—leaded steels, leaded alloys and others—is available in A. M. Castle's new steel stock book. The book also contains a time-saving reference information on selecting the right steel, charts and tables for computing physical properties and machinability.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Furnace Line

Blue M Electric Co.—The company announces a 4-page brochure on electric ovens, gravity and recirculating, on Magni-Whirl water baths and on Lab-Heat furnaces. Units range from 100 to 2000°F and are usable in a wide variety of industrial applications.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Spray Painting

DeVilbiss Co. — "Making the Most of the Spray Painting Method" illustrates the four basic principles of spray finishing: Proper equipment; control factors important to achieve highest quality results; spray painting techniques;

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necessary care, cleaning and maintenance of equipment. This 16 mm sound film, black and white is a 45 minute feature.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Electric Control

Clark Controller Co.—A 24-page illustrated booklet issued by Clark describes advantages of centralized electrical control systems through use of ac motor control centers. Typical installations, specifications, construction details and planning tips are featured.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Inclinable Presses

Niagara Machine & Tool Works —Detailed information and specifications on the new line of Niagara open back inclinable presses are listed in 20-pages. The machines are described with operating-manual clarity. Specification tables and die space dimensions are given for the eight-press series.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Bearing Catalog

Chrysler Corp. — Amplex Division has issued a catalog covering their Oilite bearing line. It lists more than 700 standard bearings, cores, bars and plates carried in stock. 25-pages, illustrated, specifications.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

3500 Hydraulic Valves

Hydraulic Press Mfg. Co.—New line of hydraulic valves consisting of more than 3500 models is cataloged in three individually-bound volumes, classifying valves as to body style and pressure range. Catalog No. 801 covers 2000 psi valves with subplate connections; No. 821 covers 3000 psi valves with flange connections; and No. 841 covers 3000 psi subplate valves. Illustrated, with charts, diagrams.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Type 4340 Steel

International Nickel Co. Inc. — Bulletin A-173 with 16 pages, 25 charts and tables presents results of a comprehensive 3-year research and test program evaluating properties of type 4340 steel heat-treated to 260,000-280,000 psi. Data on static, impact and fatigue properties, notch sensitivity characteristics, fabricating and processing techniques including machining welding and finishing are covered

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Lathe Quality Control

Monarch Machine Tool Co. — Monarch offers a 16-page brochur entitled "Why Monarch-Hardene Structure Lathes Stay Factor Fresh". It is a picture story o their quality control of hardenin procedure and what it means t the buyer in terms of retaine lathe accuracy.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Concrete Construction

Blaw-Knox Co.—"Steel Forms fo Concrete Construction" is a 50-pag booklet describing the wide variet of form types and uses. More tha 50 photographs illustrate range o application. Practical design sug gestions and recommended data ar included.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Gear Generators

Farrel-Birmingham Co. Inc.— An 11-page booklet is offered de scribing the Twin-Head gear gen erators. Among the features cov ered are: Cutting tools, cutter re lief, index mechanism. Specifica tions and capacities given. Illus trated. Detailed diagrams.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Lightweight Structurals

Rolle Mfg. Co.—Use of light weight structural materials, in cluding aluminum, magnesium an Fiberglas, in contemporary prod uct design is described in a 16 page booklet. An objective ap praisal of their possible range o application for the future is pre sented. Methods of forming ar discussed in detail.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Inspection a Science

Roylyn Inc. — "The Royly Grapevine" includes an articl titled "Inspection Is A Science" i their February issue. It take you behind the scenes with th corps of inspectors who inspec products from raw stock to fin ished product.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Industrial Batteries

Chicago Forging & Mfg. Co.— The Battery Division offers an i lustrated circular covering ne

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7	17	27	37	47	57	67	77	87
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MORE DATA CIRCLE NO. 30 ON REPLY CARD

vator Belting

3. F. Goodrich—A handbook on vator belting describes and illtrates types of belt bucket elevors. It gives factors for belt ection, outlines procedures for gineering the correct belt and scribes belt construction feaes. 24-pages, illustrated.
MORE DATA CIRCLE NO. 31 ON REPLY CARD

ive Engineering

General Electric Co.—A 16-ge brochure provides information on various applications of ve engineering, including analing and acid tinning lines, ore dges, sintering lines, main ves for hot and cold-strip mills d auxiliary drives for blooming d slabbing mills.
MORE DATA CIRCLE NO. 32 ON REPLY CARD

otective Coatings

Atlas Mineral Products Co.—e availability of a booklet conning some 50 pages of information on protective coatings, deibed on a generic basis, is anunced.
MORE DATA CIRCLE NO. 33 ON REPLY CARD

rger Castings

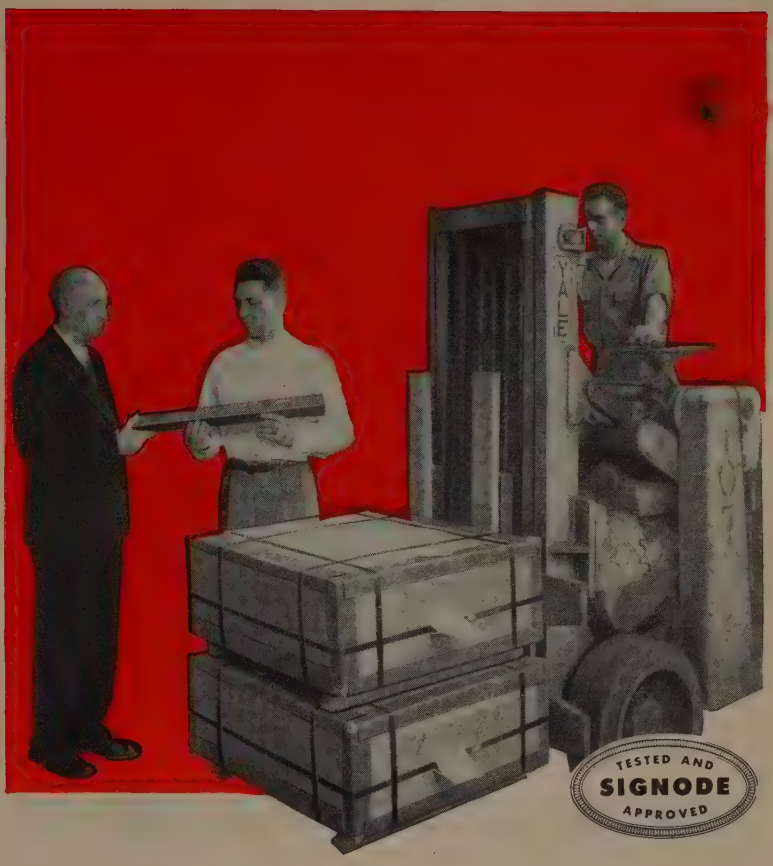
Farrell-Cheek Steel Co.—A 4-ge brochure introduces the comny's increased range, expanded include castings as large as 00 pounds. Illustrated, with ief descriptive data.
MORE DATA CIRCLE NO. 34 ON REPLY CARD

siness Telephones

Automatic Electric Co.—"The A-X Code Call Service" is a 6-ge illustrated brochure describg how executives and key emoyees can be reached quickly anyhere in a plant or office by eans of a special signaling dece that is part of an internal siness telephone system.
MORE DATA CIRCLE NO. 35 ON REPLY CARD

eep Testing Machines

Baldwin-Lima-Hamilton Corp.—ve types of creep testing maines for standard sized metal ecimens are presented in this 12-ge bulletin. Lever arm and



Another good way to put the skids under your handling costs

Through the packaging magic of Signode Steel Strapping!

Shown here is a successful adaptation by Signode of a *basic* skid-loading method, made for a shipper of tin plate.

This commodity can easily be a shipper's headache. It is heavy and slippery, and its surfaces are vulnerable — easily dented and scratched.

So Signode engineers wrapped each unit in heavy, moisture-repellent kraft paper, placed metal protectors on the edges, and fastened it to a skid with Signode Steel Strapping. Results? Safer, easier handling at lower cost!

Can Signode help you cut handling and shipping costs through practical adaptations of one or more *basic* skid-loading methods? *It costs you nothing to find out!* Write today for our folder showing 6 BASIC WAYS OF UNITIZING, and other helpful information.

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ONE MAN and a *Silent Hoist* electric-driven Car Puller can pull and spot cars . . . warp barges . . . drag pallet or skid loads, logs, quarry stone, heavy equipment . . . bend pipe . . . open hopper doors... etc. ... and Cut Your Materials-Handling Costs!

SOME TYPICAL USERS:
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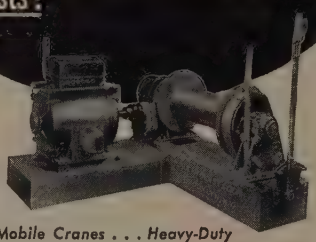
Write for Bulletin No. 64A



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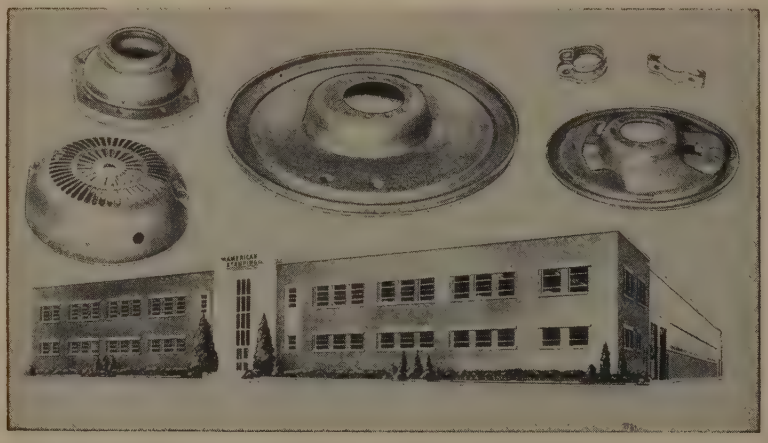

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screw type creep machines, Micro former type and SR-4 type auto matic relaxation machines and constant strain rate machine ar included. Illustrated, with dimer sional diagrams and specification FOR MORE DATA CIRCLE NO. 36 ON REPLY CARI

Research Facilities

Designers for Industry Inc.—4 24-page illustrated facilities boo describing the diversified engineer ing research and development be ing carried on by the company technical staffs is available. Th company's Project Manager Sys tem and operating policies are als explained in chart form.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARI

EDITORIAL REPRINTS:

Salt Baths

L. B. Rosseau, Ajax Electri covers what's new in salt baths i a recent issue of STEEL. Fo heating and cooling metals ther is a wide field of usefulness. Thi article is a rundown on basic cha acteristics that back up presen day applications.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARI

Titanium Carbide

Two experts report that user have mill yield up 2 per cent an net savings per ton up to $2.7 due to trimmed downtime. Wit titanium carbide as the new elixi of life for rod mill guides, wea life ration is as high as 45 to 1.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CAR

Stampings

A staff-written STEEL articl tells how stampings offer ways t cut corners. A fourteen-part a sembly that required welding, ma chining and assembling can be in corporated into a single stampin

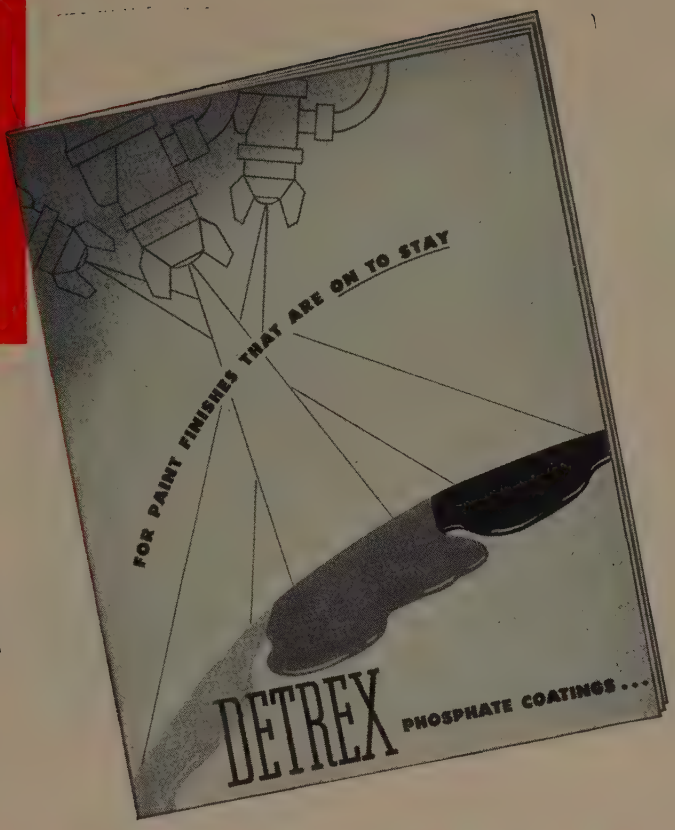
FOR MORE DATA CIRCLE NO. 40 ON REPLY CAR

Copper Base Alloys

Last in a series of three. Thi STEEL article tells how to classif copper base alloys. Most copper base compositions for castings ar mixed brass and bronze. Usuall in the alpha range, alloys ofte contain lead and other minor in gredients.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARI

DETREX
PHOSPHATE
COATINGS



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. . . because it tells how Detrex can help you obtain greater sales appeal for your painted metal products through better paint finish and longer paint life.

This new booklet describes PaintBond, a zinc phosphate coating for metal surfaces prior to painting. This fine-grained crystalline coating is applied by spray or immersion means, to provide millions of microscopic crevices into which the paint flows. Your paint is *locked on to stay* for a beautiful, durable finish.

Insoluble in water, PaintBond seals off the metal from moisture and other causes of corrosion. Even if the paint finish is marred or scratched, rust is confined to the exposed area. The surrounding paint remains locked securely to the metal.

PaintBond is economical to use and meets government specifications for phosphate coated surfaces.

Applications and equipment recommendations are fully described in this new booklet which also tells about the laboratory, manufacturing, engineering, and field service facilities of Detrex—a company long experienced in serving industry with both the equipment and the chemicals for all cleaning and phosphate coating requirements.

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P-2

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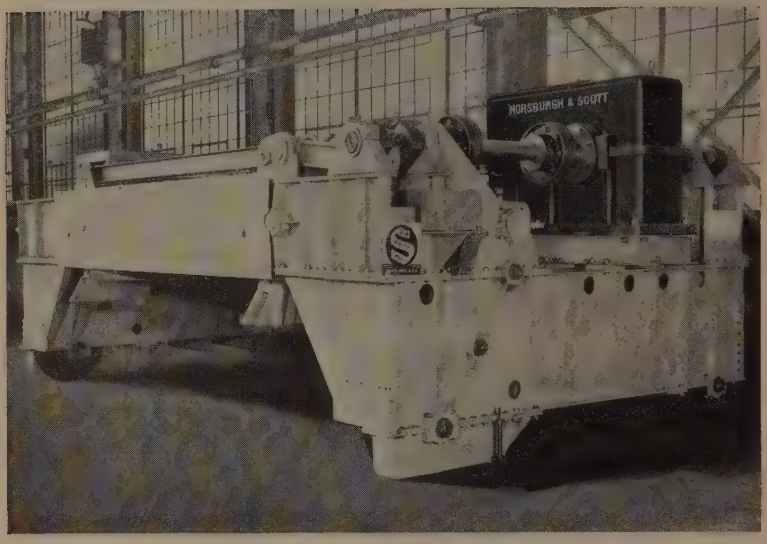


soaking pit cover through . . .

H & S REDUCERS

• The above photograph shows a soaking pit cover crane designed and built by Salem-Brosius, Inc. Two Horsburgh & Scott Helical Speed Reducers are used on each crane...the lift drive handles a cover weighing about 28 tons and operates at a speed of 6′ per minute...the traverse drive moves the crane at a speed of 88′ per minute. Many of these cranes have been operating very satisfactorily for twelve to fifteen years...actual tribute to complete engineering design.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

Send note on Company Letterhead for Speed Reducer Catalog 46

NEW PRODUCTS and equipment

Expanded Press Line

. . . with three new features

The No. 0 five-ton Press-Ri Press has three new feature Heavy duty bronze bushings the fly-wheel, heavy bronze we plates in the ramway, new hea duty clutch.

This press is the smallest of t

Press-Rite line. It has heavy co struction features of the heavi members of the line, includi high tensile alloy cast reinforc frame, single stroke safety mec anism and knock-out bar in sli Sales Service Machine Tool Co.

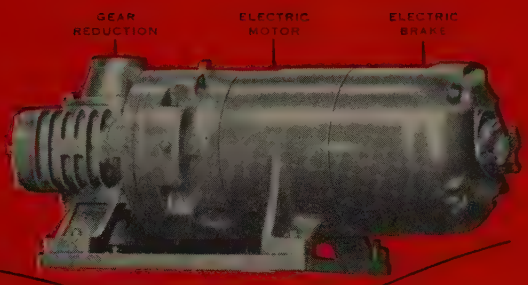
FOR MORE DATA CIRCLE NO. 42 ON REPLY CA

Twin Barrel Finisher

. . . utilizes moveable chutes

A twin barrel finisher bu around a new idea in handli convenience has been designed

Rampe. It involves the use movable chutes under the barr which can be tilted to the rear drain off liquids and then can

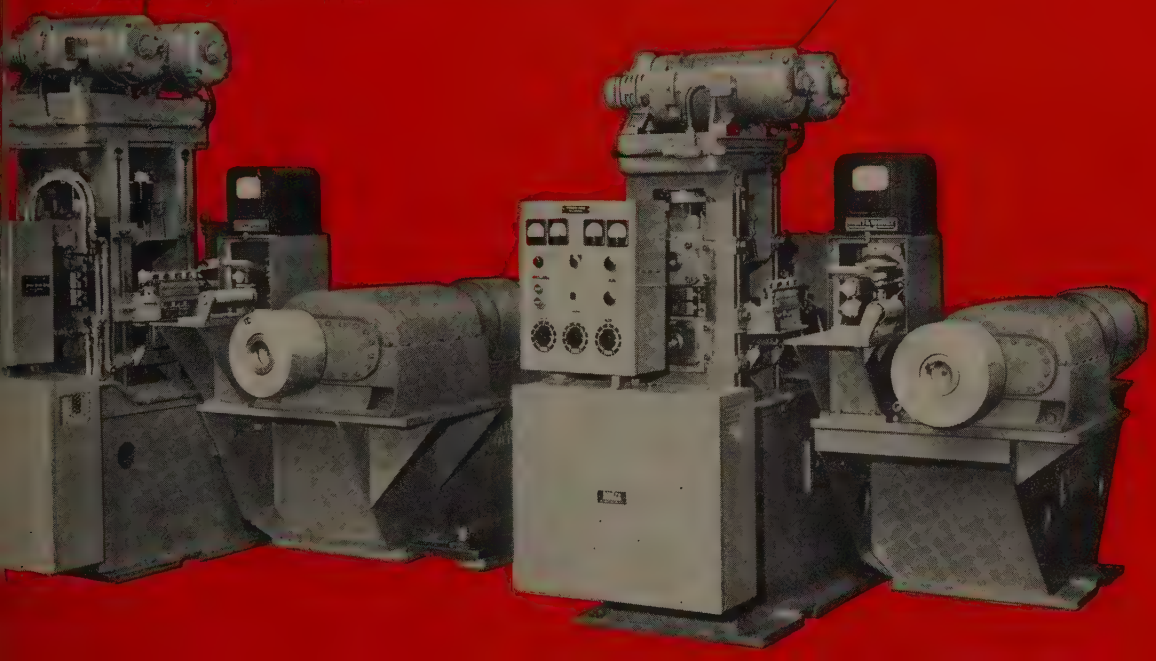


See how easily the standard electric motor, standard gear reduction, standard electric brake combine into a drive that gives the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features . . . all in one compact unit. Nowhere else will you find power units that are so flexible, so easily adaptable, and in such a wide range of types and ratings.

Master power drives are available in thousands and thousands of ratings (⅛ to 400 HP) . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for you.

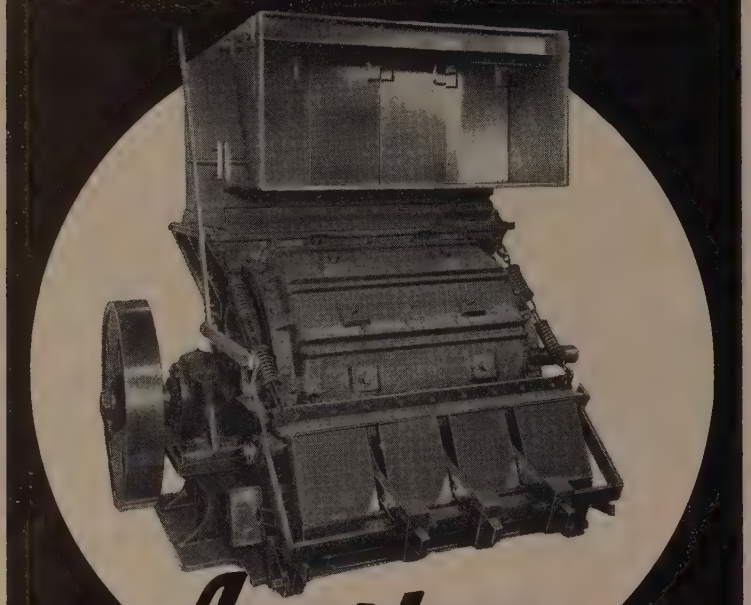
standard units easily combine into special purpose drives

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



CASH IN YOUR CHIPS

Change Metal Turnings Waste into More Profitable Shoveling CHIPS



American METAL TURNINGS CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: $4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings per Year (20 tons/month at $4 extra per ton)	$ 960.00
6,000 Gallons Recovered Cutting Oil at 30¢/Gal. (50 gals. per ton x 240 tons = 12,000 gals. Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation)	$1,800.00
Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc.	$ 300.00
TOTAL GROSS PROFIT	$3,060.00

WRITE for Metal Turnings Crusher Bulletin.

American PULVERIZER COMPANY

Originators and Manufacturers of Riley Crushers and Pulverizers

1539 MACKLIND AVE. • ST. LOUIS 10, MO.

tilted forward to deliver the lo to proper containers.

Chutes tilted to the rear, whi the machine is in operation, for an effective guard around the mo ing barrels. The twin barrels this finisher have a load capaci of 1.1 cubic feet each. Barre are made with the largest possib opening. Rampe Mfg. Co.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CA

Hydraulic Tools

. . . to stretch and seal

Hydraulic stretching and se ing tools for centralized packa strapping have been developed Acme Steel. The equipment i cludes: Power unit, hydrau

stretcher and sealer, electrica powered band dispenser. The d sign of the tool reduces operat fatigue and allows the use strapping directly from the co

The equipment has been dev oped for the strapping of fl sheet metal and finds applicati wherever ferrous or nonferro sheets are packaged for shipme The strapping station is intend to be part of a conveyorized m terial handling system co-ordina ed with production facilitie Acme Steel Co.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CA

Atmosphere Testing Unit

. . . for visually testing gas

A portable, visual unit for tes ing gases has been introduced Electric Furnace. The unit is sa

have valuable application in
research and production de-
tments of any plant using
cial atmosphere or heat-treat-
furnaces.

With the unit the operator can
ermine, quickly and easily, the

lity of gas being produced by
special atmosphere generator,
the quality of the atmosphere
special atmosphere heat proc-
ing furnaces. It is also used to
ect the presence of sulphur det-
ental to bright annealing treat-
nts.

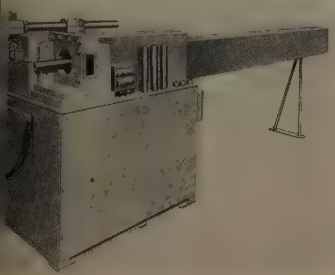
The unit is housed in a metal
e approximately 22 inches long,
nches wide and 9 inches high.
e weight is approximately 35
nds. Electric Furnace Co.

MORE DATA CIRCLE NO. 45 ON REPLY CARD

oe Cutter

. handles wide range

A machine working on the same
nciple as the Brehm Trimming
, cutting the tube without waste
loss of stock and leaving a flat



burred edge, is announced by
el Products.

The machine will handle tubes of
y diameter from ⅜ inch to 2
hes. Special adapters for larger
es are available. The tube cut-
will handle tubes in a wide
ge of stock thickness and tubes
mild steel, stainless steel, brass,
per, aluminum — almost any
terial from which tubes are

Can You Check YES to these five questions?

- ☐ Do the gears you use have surface-hardened teeth?
- ☐ Are the cores tough, ductile, and shock-resistant?
- ☐ Do they always fit perfectly and require no run-in?
- ☐ Are they guaranteed to give maximum service life?
- ☐ Are you completely satisfied with them?

If not, you should use —

PITTSBURGH purple

—Your Guarantee of Longer Life

GUARANTEED PITTSBURGH ARMORED PRODUCTS

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ARMORED GEARS are made only by PITTSBURGH GEAR from an exclusive formula perfected by PITTSBURGH engineers. It covers metal, machining, and a method of heat-treating that hardens the wearing surfaces but leaves the core tough, ductile, and shock-resistant.

All PITTSBURGH gears are made to extremely close tolerances to fit perfectly right from the start. They are guaranteed to give you five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service.

You can readily identify **Armored Gears** by their distinctive corrosion preventive coating—"**Pittsburgh Purple**"

You'll save money if you use PITTSBURGH **Armored Gears**. Send your specifications to us today. We'll quote promptly on one or any quantity of gears you need.

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MITRE
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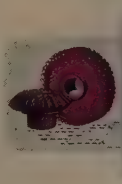
HERRINGBONE
WORM GEARS
REDUCERS
CRANE WHEELS



PITTSBURGH GEAR COMPANY

Neville Island
Pittsburgh 25, Pa.
Phone: SPaulding 1-4600

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

BRAZE HARDENED PARTS SAFELY... with EASY-FLO

With EASY-FLO — the low-temperature silver brazing alloy — you can braze parts that have been hardened, without appreciably affecting their hardness. That's because EASY-FLO's low brazing temperature, plus its remarkably fast penetration the instant this temperature is reached, greatly reduce the amount of heat and the heating time required.

By using copper bars as "chill bars" to help dissipate the heat, you can make doubly sure of preserving the hardness of the parts.

HERE'S AN EXAMPLE— a hardened steel part of a ticket vending machine, brazed for the General Register Corp. by Salkover Metal Processing of New York, Inc., Long Island City, N.Y., metal joining specialists.

At left is a hardened steel machine part and the two brackets that are brazed to it; also two copper chill bars, one of which has a clamp screw.

At right you see the hardened assembly clamped between the two chill bars and the arm bracket being brazed to it with 3/64" EASY-FLO wire. Clamping assures the close contact needed for good conduction of heat to the chill bars. Both brackets are brazed with no appreciable change in the hardened surfaces.

FIND OUT WHAT EASY-FLO BRAZING WILL DO FOR YOU

BULLETIN 20 gives full details about the remarkable metal joining strength, speed and economy manufacturers everywhere are getting with EASY-FLO low-temperature silver alloy brazing. Write for a copy today.

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made—can be cut with this tul cutter. The machine is load from the front by sliding the tul onto the cutting arbor. The cu ting operation is entirely automati Steel Products Engineering Co.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CAR

Bench-Type Center Mike

. . . measures in 10 seconds

A bench type center mike th measures center distances to .000 inch tolerances is announced b Sorensen. Measuring in 10 se onds, regardless of hole sizes, it

ideal for production gaging c small, flat or irregular metal com ponents having center distance ranging from .040 to 12.4 inches.

This precision tool is ready fo instant use on any combination c holes within range and affords half-thousandth center - to - cente reading without figuring, interme diate reading and knowledge c hole sizes required by conventiona methods. This direct reading fea ture assures precise measurement in 10 seconds—a considerable sav ing for this operation. Unusua versatility of the center mike i evidenced by the fact that diame ters from .030 upward can be meas ured. Easy to operate. Sorense Center-Mikes Inc.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CAR

Polyethylene-Lined Drums

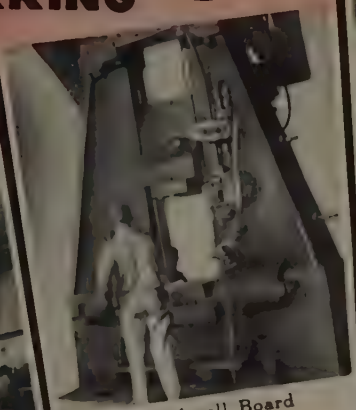
. . . for shipping chemicals

Polyethylene-lined drums wi be used by Hanson-Van Winkle Munning for shipping all chem icals packaged at the Matawa plant. Replacing wax-lined an unlined fiber containers, the ne drums will permit customers t store chemical supplies longe without loss of net weight or dam age to either product or container

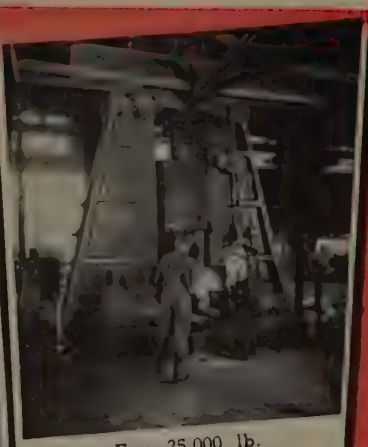
The lining, which is inert to a

DIVERSITY OF EQUIPMENT for METAL WORKING

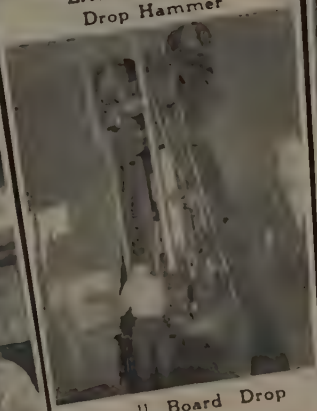
500 ton Hydraulic Press



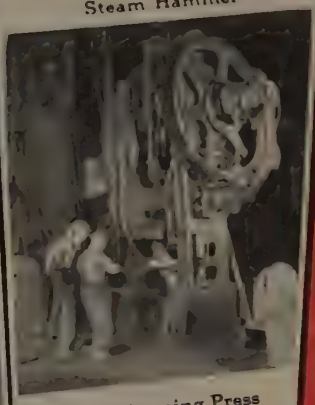
Erie 4 roll Board Drop Hammer



Erie 25,000 lb. Steam Hammer



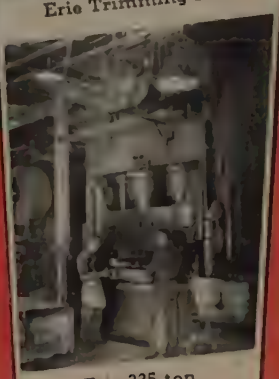
2 roll Board Drop Hammer



Erie Trimming Press

Erie Single Frame Forging Hammer

Erie Double Frame Forging Hammer



Erie 335 ton Hydraulic Press

FOR more than half a century Erie Foundry Company has served the metal-working industry with top performance steam and air operated hammers, board drop hammers, double and single frame forging hammers, trimming presses and hydraulic presses. Before making your selection consult with our engineers.

Bulletins on all of these products are yours on request.

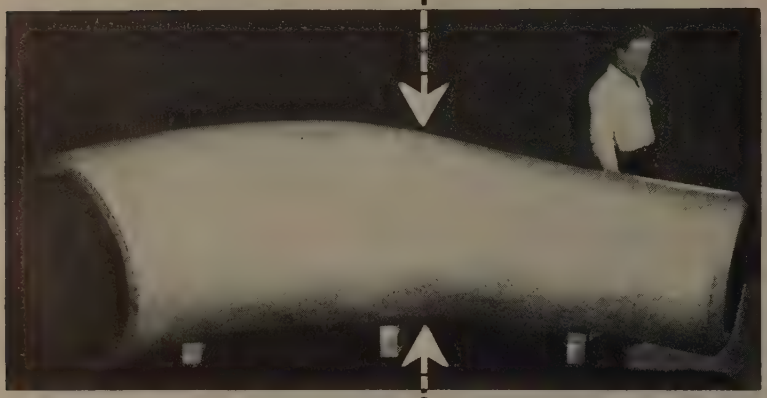
ERIE

ERIE FOUNDRY COMPANY ERIE, PENNSYLVANIA

Dependable **FORGING HAMMERS • HYDRAULIC PRESSES**

DURALOY

This Casting



Casting weight
21,000 pounds

Shipping weight
14,000 pounds

Alloying Elements
38% Ni., 18% Cr., 2% Mo.

Set a Record!

It's the weight rather than the Ni-Cr content that's the record.

We've cast many a piece with such a high Ni-Cr combination. But this represents the largest casting we have ever made. And it took careful scheduling of our entire battery of electric furnaces, with a double melt from two smaller furnaces.

Next followed a thorough X-ray for hidden flaws with our 400,000 volt unit. Then rough-finishing to specifications.

The significant fact is that this casting, the first of this size we have ever produced and destined for a most important high priority processing job, passed inspection with flying colors. *There was no reject here.* It is indicative of the skill of our metallurgists and foundrymen in turning out high alloy castings.

If you are looking for this kind of service, make Duraloy your casting source.

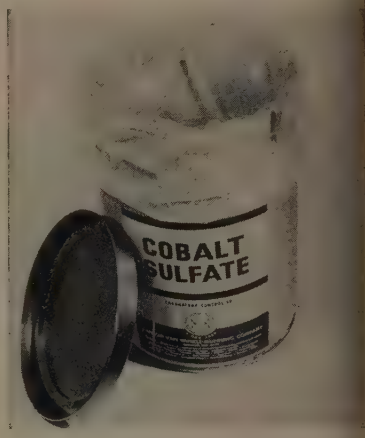
THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.

Detroit Office: 23906 Woodward Avenue • Pleasant Ridge, Mich.
Atlanta: J. M. TULL Metal & Supply Co. Chicago: P. O. NELSON 332 S. Michigan Avenue

METAL GOODS CORP: Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

products shipped, will prevent deliquescent products from losing moisture during shipment and



storage. It will also prevent moisture from damaging hygroscopic products. Hanson-Van Winkle-Munning Co.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

Nylon Bearing

. . . on corrosive applications

Boiled in a 75 per cent solution of oakite, Metzgar's nylon bearing remained in perfect operating condition, showing no measurable effect of the test. A similar test was run in a 65 per cent salt brine solution, with the same results.

These bearings feature construction that reduces the weight approximately 17 per cent. Now available to industries where brine, alkali and acid conditions cause repeated failures of ball bearing type conveyors, they come in standard 11½, 15, 18 and 24-inch widths; lengths as desired. Metzgar Conveyor Co.

FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

Plating Bath Additive

. . . acid spray eliminated

A Udylite additive eliminates chromic acid spray in the chromium plating bath operations.

A new surface active agent of a chemically different structure, Zero-Mist completely prevents air and airborne contamination. It is not affected by concentrated chromic acid solutions at any temperature or by the highest anode

ourteen-year-old loads heavy duty press!

he battery powering the truck nown above recently celebrated its urteenth year of top performance r an exclusive EDISON battery user.

he same user also has two EDISONS their 11th year of service, one in ne 13th, two in the 14th and one in ne 21st year of service. This long, rouble-free life is a typical example f service that can be obtained from DISON batteries in industrial-truck ork. It illustrates how EDISON'S steel cell construction and fool-proof electrical characteristics give the most dependable battery power at the lowest over-all cost.

Want to know more about the EDISON features which make this kind of performance possible in industrial-truck operation? Simply ask for a visit from the Edison Field Engineer in your area today. Write Edison Storage Battery Division, Thomas A. Edison, Incorporated, West Orange, New Jersey.

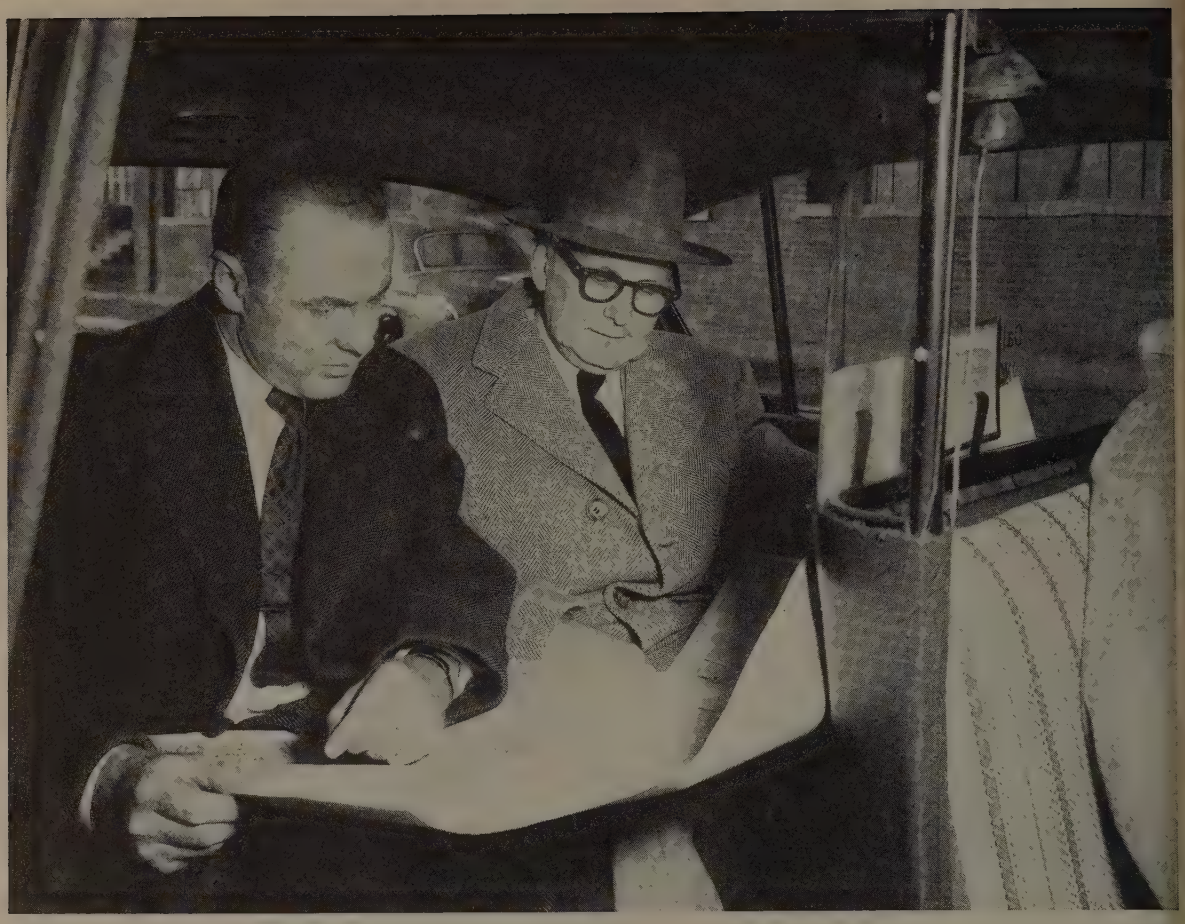
Most dependable power... lowest over-all cost you get both with an EDISON

EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

EDISON ALSO MAKES THE FAMOUS "V.P." VOICEWRITER AND THE TELEVOICE SYSTEM



"...and they can fabricate their tube into the parts we need!"

"And, even more important, fabricated tubular parts cost less money!

"Take the job we had at the plant last week. If we had followed the original suggestions, we would have had to form and assemble three different pieces. But Wolverine gave us a better answer.

"They just took a 6" length of 1½" diameter tube. Using their unique Spun End Process†, they closed one end completely, reduced the other end to 3/16" diameter, added a bead, and there we were."

"I remember the cost sheet. We knocked off 6¢—just about half!"

"That's right! And on this job, where we need to save space, I'm going to suggest Wolverine Trufin*."

"What's that?"

"It's a one-piece finned tube—the fins are actually part of the tube wall—integral, they call it. They can bend Trufin, coil it, fabricate it, just like plain tube."

★ ★ ★ ★

WANT TO SEE IT IN BLACK AND WHITE? Just give us a chance to show you how much we can save in fabricating a tubular part to your specs. And—remember Trufin—it's available in copper, copper-base alloys, aluminum, steel or bi-metal. Write for Wolverine's booklet "Fabricated Tubular Parts" today. WOLVERINE TUBE DIVISION, of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario

EST. 1916

WOLVERINE TUBE DIVISION
OF CALUMET & HECLA, INC.

Manufacturers of Quality-Controlled Tubing

† A PATENTED PROCESS RE.22465
* REG. U.S. PAT. OFF.

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. Sales offices in principal cities.

NEW PRODUCTS and equipment

· cathode current densities ob-inable. In addition to completely iminating mist and spray, it also ›duces film drag-out up to 50 per ›nt by its ability to lower the sur-ıce tension of the chromium plat-g solution to an unusual degree. dylite Corp.

›R MORE DATA CIRCLE NO. 50 ON REPLY CARD

lectric Fork Trucks

. . . safe near explosive vapors

Underwriters' Laboratories - ap-roved Electric Carloader Series ›rk trucks for operation in haz-rdous areas covered by Under-riters' Class I, Group D classifi-ation, in capacities from 3000 to 000 pounds, are available.

These production-model elec-ic fork trucks, with UL ap-roval, have an EX truck rating

hich means that they are ap-roved for operation in atmos-heres containing explosive va-ors. Clark Equipment Co.

›R MORE DATA CIRCLE NO. 51 ON REPLY CARD

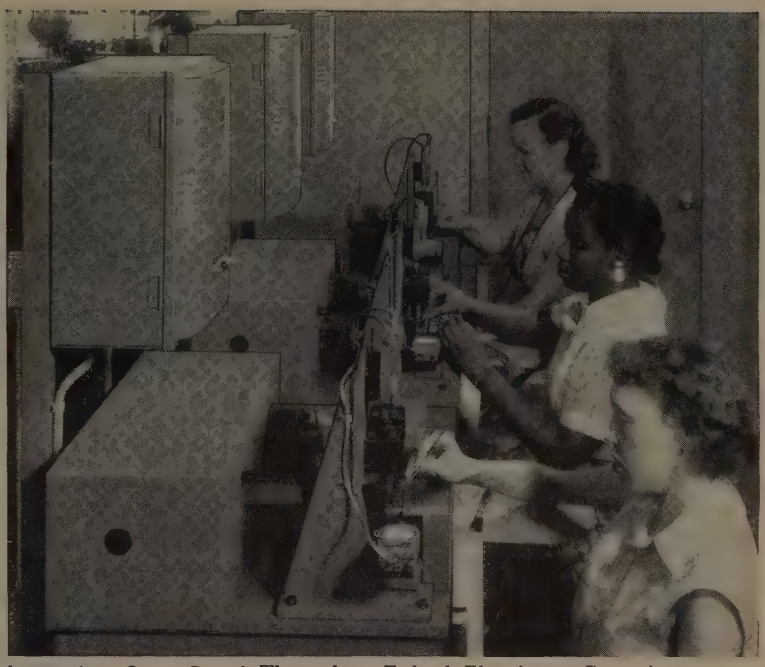
utter Series

. . . for heavy duty

In response to on-the-job de-nand for heavy duty portable cut-ers, Porter engineers have devel-ped an all-steel tool with heat-reated tubular steel handles built ›o stand up under the heaviest ısage.

This tool will stand continuous utting of hard concrete reinforc-ng rods up to ½ inch in diam-ter and wire rope and cable up ›o ¾ inch in diameter. Models lso are available for cutting soft olts, medium hard rods, etc. I. K. Porter Inc.

›R MORE DATA CIRCLE NO. 52 ON REPLY CARD



Inspection Costs Drop! These three Federal Electricator Gages inspect two diameters, a shoulder distance and overall length of tiny watch parts . . . simultaneously. Signal lights tell when dimensions are off-size. Dial indicators show how much.

Oversized Costs Measurably Reduced!

Cost-cutting programs pay off only when your process, production and quality control engineers use up-to-date methods and equipment. How much are outmoded gages handicapping their progress?

Your costs can be cut seven ways when modern Federal Gages take over:

1. **Reduction** in undersize dimensions and oversize holes which scrap up to 10% of production.
2. **Less rework** on oversize work which hogs as much as 30% machine time in some plants.
3. **Material costs** cut through purchase of smaller-sized stock, made possible by holding work to closer tolerances.
4. **Inspection time** halved when visual indicating gages replace ordinary micrometers, vernier calipers and fixed gages. Even higher savings result when Federal multi-dimensional and sorting gages are used.
5. **Quality control** simplified by gages that warn machine operators before they produce scrap.
6. **Assembly speeded** when visual indicating or automatic sorting catches out-of-tolerance parts formerly overlooked because of human error.
7. **Gaging costs** cut when modified Federal stock gages eliminate need for costly special gage engineering.

Investigate! Catalog 52 shows your production and quality control engineers Federal Gages which help cut costs all along the line. Write for your copy today. Federal Products Corporation, 1213 Eddy St., Providence 1, R. I

Ask FEDERAL

FOR ANYTHING IN MODERN GAGES . . .

DIAL INDICATING, AIR, ELECTRIC, OR ELECTRONIC—FOR INSPECTING, MEASURING, SORTING, OR MACHINE SIZE CONTROL.

Fig. 1—Thermos vessel looks simple at first glance but wall gage is quite light for a part of its size

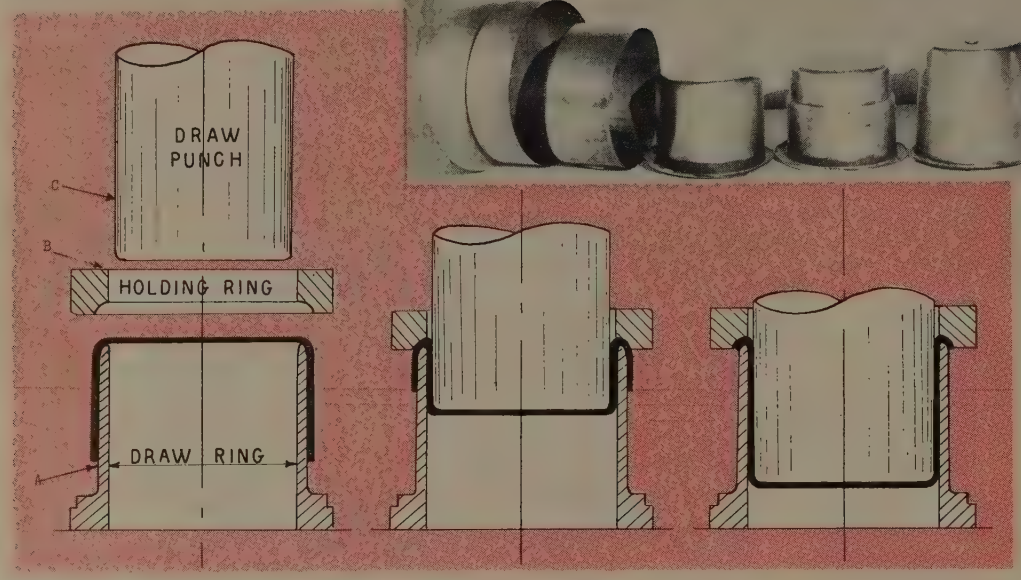


Fig. 2—Reverse draw turns drawn cup inside out, reduces its diameter. It is felt that this helps to avoid wrinkles

Deep Draws Don't Follow Rules

Versatile process does not lend itself to handbook science. Beyond a few basic principles, variables, such as corner radii and tolerances, enter the picture

By J. WALTER GULLIKSEN
General Superintendent
Worcester Pressed Steel Co.
Worcester, Mass.

BECAUSE of its versatility, deep drawing has not been reduced to a handbook science.

Of course, some principles, such as metal flow and per cent reduction, have been developed, but they must be tempered to suit conditions.

Shape and dimensions of the part fix a basic approach, but from this point variables take over. Corner radii and tolerances may add several operations on almost identical parts. Temper and gage tolerances of materials can influence tooling. And in even the biggest shops, equipment can be a problem.

Small wonder design and development of tools for a complex deep draw still require the skill of a specialist who is largely guided by an intuitive understanding of metal behavior.

Example—Take the case of a brass thermos vessel. At first glance, the bucket-shaped container may look simple. However, wall gage is quite light for a drawn part of its size; and tapered sides can lead to objectionable wrinkles if treatment is not skillful.

Fig. 1 shows production stages. First draw in a double-action toggle press produces a cup about 11¼ inches in diameter—a 34 per cent reduction from the 0.025 gage blank, 17 inches in diameter. Second draw in the same press brings cup diameter down to 9⅝ inches.

Third step is a reverse draw that turns the cup inside out—Fig. 2. Cup is placed over a sleeve (A) with closed end up. Fitted pressure ring (B) acts as a hold-down. Punch (C) draws cup through sleeve, causing a complete reversal of the cup, together with a reduction to 7 13/16 inches in diameter. It is felt that a reverse draw of this kind helps to eliminate wrinkles in light stock with severe draws.

Windup—To produce the step in the side wall, cups are drawn part way into a die (7 5/16 inches in diameter) and ejected. After necking, the small end is 7 5/16 inches in diameter, the large end 7 13/16 inches.

Fig. 3—Anode shield was made from 0.035-gage copper strip. Material needs ductility plus tensile strength

Final operation is an over-all iking, during which the punch etches out the parts, forcing em into a complete die cavity. cetching action eliminates any ndency to wrinkle as the taper formed in the side wall. This eration also sets the shape of e bottom. Parts are roll trimmed remove the flange and are then dy for secondary work.

Copper—Ductile nature of this terial is so well known that it natural to expect to see parts awn from it. One of the sur- sing points one learns in fab- ating it is that plasticity is not unmixed blessing.

In drawing a cup of any kind, e draw punch applies pressure ainst that part of the stock that comes the closed end of the cup d literally pulls the balance of e material through the die to m the skirt.

To draw well, the material must plastic and have sufficient ten- e strength to withstand this vere treatment without rupture excessive thinning. It also be- mes important to use fairly large radii on the draw die and punch end.

Anode Shield—Production stages for a copper anode shield (0.035 gage copper strip) are shown in Fig. 3. Product is a sleeve 4½ inches long, tapering from 3.820 to 3.020 inches in diameter. Combination blank and cup operation in a double-action cam press produces parts 5 1/32 inches in diameter from a blank 8⅜ inches in diameter. Reduction is 40 per cent.

Second draw (a 31 per cent reduction) on a double-action toggle press takes the part down to 3.450 inches in diameter. In both draws, care must be taken to use minimum hold-down pressure consistent with avoiding wrinkles. Stock has tendency to thin out or neck at stressed areas.

Third press operation is a single-action draw that is not carried to completion. Cups are reduced to 3.025 inches in diameter at the closed end and part way up the side wall—after which they are ejected from the die. This produces a stepped cup 3.450 inches in diameter at the larger section and 3.025 inches in diameter at the smaller end.

A final press operation strikes the tapered shape, expanding the open end to 3.822 inches in diameter and reducing the smaller end to 3.020 inches in diameter. Secondary machining removes the bottom and trims parts to length.

Steel—In general, this material becomes more difficult to cold work as its carbon content increases. So it is something of an achievement to produce a pressure cylinder (Fig. 4) from 4130 steel. Dimensions are 2¼ OD by 0.087 inch wall by 11 inches long before the neck is swaged.

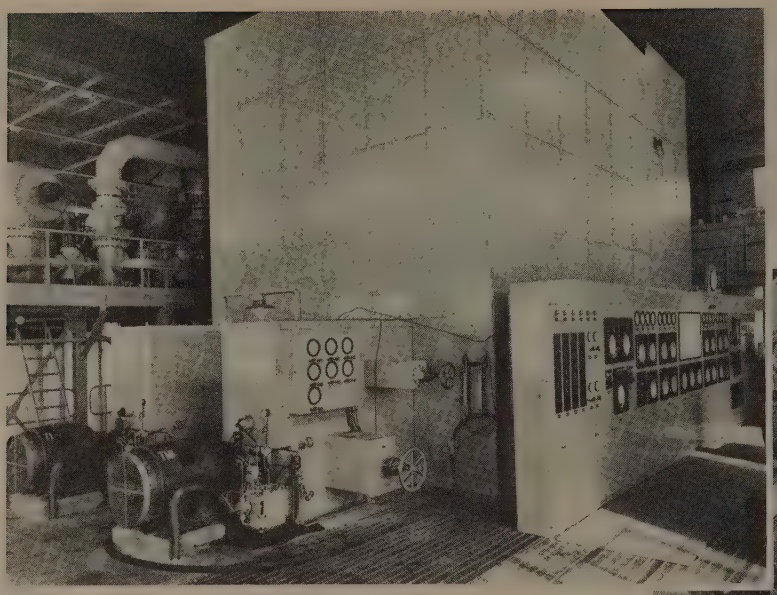
Because of the heavy gage and size of blank required, a separate operation is used to stamp discs 10⅜ inches in diameter from 0.087 inch thick, hot-rolled material. First cup (6 inches in diameter) is then drawn in a 150-ton, double-action cam press—a reduction of 42 per cent.

After annealing and pickling, cups are redrawn to 4½ inches in diameter—reduction of 24 per cent. Heavy gage permits drawing straight through in a single-action press.

Four more draws in long-stroke, single-action presses reduce diameter to 3.665, then 3.011, then 2.525 and, finally, 2¼ inches OD. Parts are annealed and pickled between operations.

After deep drawing, open end is swaged to the neck shape, which is then threaded. Containers carry gas under high pressure for inflation of life-saving rafts.

. 4—The pressure cylinder above was deep drawn from 4130 steel. required several draws, plus the annealing and pickling operations



Main liquefaction equipment is inside the large casing behind the control panel. In foreground are two turbo-expanders which provide the refrigeration for the plant

Each exchanger contains about 40 copper tubes wound in coil form. Ver cold gaseous nitrogen will flow ove coils to further cool liquid air insid

Smelter Operates Tonnage Oxygen Plant

International Nickel needs vast quantities of oxygen for its direct flash smelting of copper concentrates. Theirs is first O_2 plant in Canda, but look for more to follow

TONNAGE oxygen plants for metallurgical uses took another step towards becoming a trend with the completion of a 300-ton-per-day unit at International Nickel's Copper Cliff, Ont., smelter. A volume of 7.5 million cubic feet—enough to fill 32,000 standard cylinders—of 95 per cent pure oxygen is produced every 24 hours.

Inco's new oxygen flash smelting process eliminates the fuel normally required for smelting and makes economical the present large-scale output by Canadian Industries Ltd. of liquid sulphur dioxide from furnace exhaust gases.

Liquefaction Process — Oxygen plant, designed and built for International Nickel by Canadian Liquid Air Co. Ltd., and known as an "Oxyton," separates oxygen from atmospheric air by the liquefaction process, using the same basic principles involved in smaller commercial oxygen plants. Air is liquefied under pressure in a series of compressors, regenerator-heat exchangers, distillation columns and other equipment. Finally, oxygen is separated from the other constituents of the atmosphere—nitrogen, argon, neon and krypton—and carried in a 16-inch-diameter elevated pipeline from the Oxyton to the smelter, a distance of 6,000 feet.

As temperatures as low as several hundred degrees below zero are involved in the liquefaction process, special consideration had to be given to the types of metals and other materials employed in certain parts of the oxygen generating unit. For example, the important regenerator-heat exchanger system consists of two nitrogen regenerators, each eight feet in diameter and 17 feet long, and two oxygen regenerators, each four feet across and 14¾ feet long.

Special Steel—While one pair o regenerators chills the incomin air, the other pair is being chille by the separator gases. Workin temperatures range from 80°F t minus 280°F. Since most ferrou metals suffer a marked increas in brittleness at sub-zero tempera tures, the regenerators were mad from special 8½ per cent nicke steel, developed by Internationa Nickel for low temperature use The regenerators are of welde fabrication, type 310 stainles steel electrodes being employed.

Despite its size and intricacies the operation of the Oxyton is es sentially automatic, once the lique faction process has been started Control and metering are carrie out by modern electronic equip ment with over 40 control instru ments centralized on a huge op erating panel.

Castings for the Connoisseur

If there were a gallery where casting works of art were displayed, there's no doubt that Sivyer castings would wear many a blue ribbon. Indeed, the most critical judging would reveal only casting perfection . . . unblemished finish . . . sharp corners . . . clean cored holes . . . absence of excess metal. Manufacturers who insist on the ultimate in steel castings know that the Sivyer Ⓢ means less handling . . . lower machining time greater dependability . . . longer service life. Look for it.

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Soft Spot in Costs

Setup slugs are patterns for tool setting on repeat multi-spindle automatic jobs

SETUP SLUGS cut setup time by as much as 50 per cent on the multiple spindle automatics at Fulton-Sylphon Division, Robertshaw-Fulton Controls Co., Knoxville, Tenn.

The company makes over 3200 different models of temperature control valves. Jobs must be released in small lots to keep inventory down to a profitable level.

Tough to Cut—The automatics produce the bellows components from corrosion-resistant materials such as stainless steel, monel, aluminum bronze and phosphor bronze. All are extremely abrasive, necessitating frequent resharpening and replacement of cutters.

These factors made it a must that turning cost factors be reduced wherever possible. Speeds and feeds were pretty well fixed, so the best chance for a reduction in time and cost was in the setup.

Prototype—When a repeat job is to be run, a setup slug is inserted in one of the collets and indexed to each of the five positions on the Warner & Swasey machines. The slug is actually a completed part which has not been cut off from the bar stock stub.

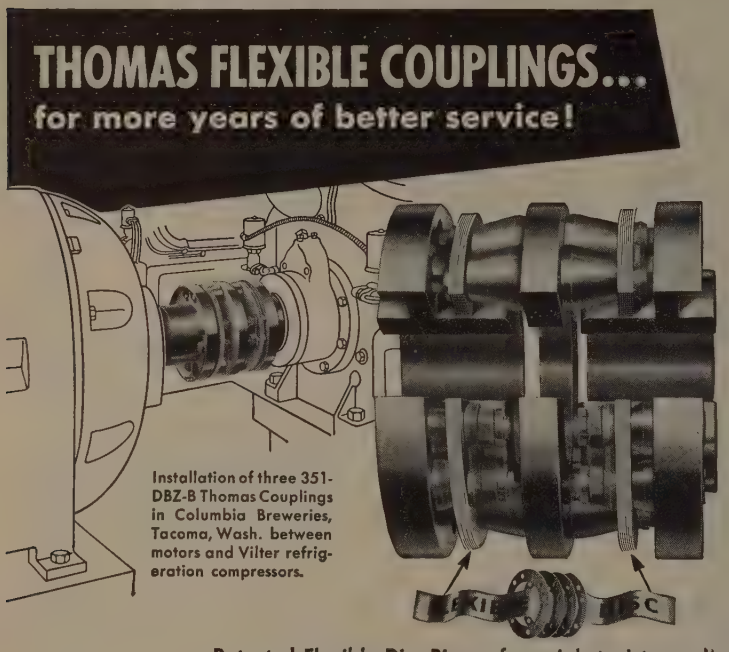
As the slug is indexed around the cutters in each station are set to an approximation of the finished part. After the machine is loaded with bar stock, finished size on the parts can be obtained from the micrometer adjustments on the cross slides.

Job Switch—As a result of the decreased setup time, it is now economical to run some jobs on the automatics that formerly were done on a turret lathe. On a recent run of 2200 pieces, the company reports that the aluminum bronze parts were produced at the rate of 62 seconds per piece. Previously their best turret lathe time was 5¼ minutes per piece.

Machined parts on the table actually are prototypes of the finished piece. They're for quick-setting cutters on short-run multi-spindle automatic jobs.

Carbide Binder Supply

Binder phase in cemented carbides is under investigation by Dr. Fritz Lenel, Rensselaer Polytechnic Institute for G-E's Carbolo Dept. The institute reports current phase of the research program should be completed for Carboloy by the end of this year.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Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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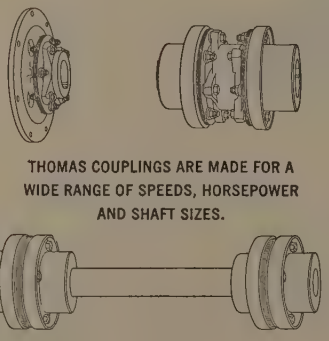
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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Small Fry... Big Business

*Another example of how Carpenter *Application Engineering Service is helping industry cut costs, build sales.*

Mention cowboys and Indians to kids from 3 to 13 and their eyes light up, cap pistols start barking, and the fun n. The game hasn't changed much or lost its excitement e we were small fry . . . but today it spells big business.

d making novelties like this decorative piece for belts and sters in multi-million quantities, calls for a fine sense of duction know-how and cost control. In this case, the npany wanted to hold down costs by cold forming the ressions in the dies, rather than machining them. This ed for a special kind of die steel . . . one that would "take" the master form or hob but would still stand up in the presses under long, punishing runs.

Again, Carpenter was called in, and **A**pplication **E**ngineering **S**ervice went to work. Super Samson, a new steel developed in Carpenter laboratories for just such jobs, was recommended and used. Now the Company reports that Super Samson has saved considerable money in the *making* of the dies . . . and the Super Samson dies are turning out the novelties in big, profitable quantities.

Time and again, industry is finding new ways to save money and improve product sales with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service backed by almost 70 years of leadership in specialty steel development . . . a service that uses imagination to help your shopmen apply steels for best results. **A. E. S.** is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

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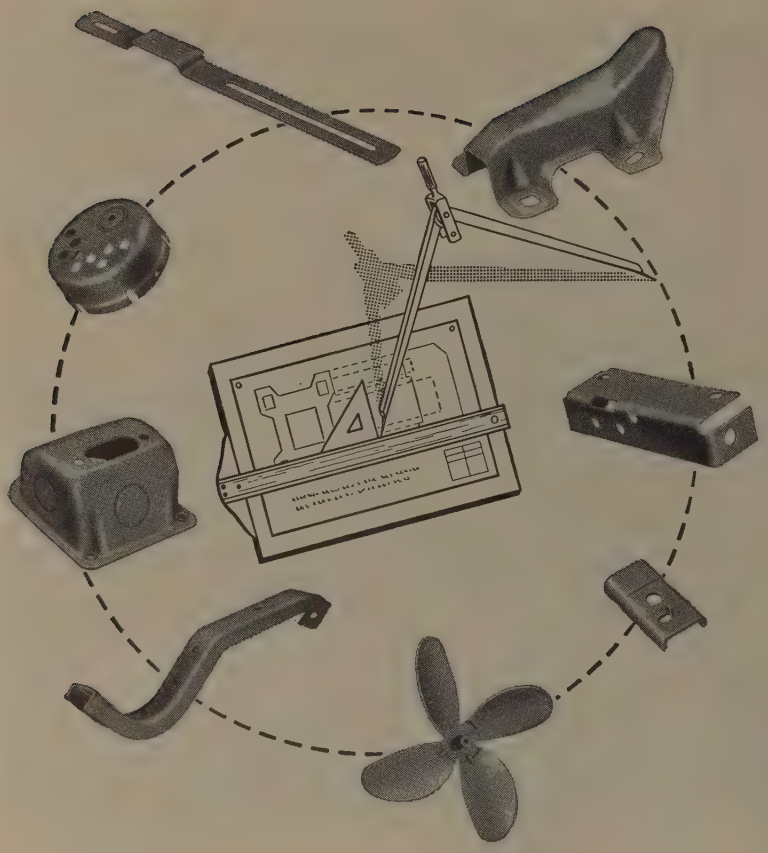

Design for Economy...

with Stampings by Geometric

To a large extent the cost of your product is determined right on the drawing board. In designing new products or redesigning old ones don't overlook the cost-saving advantages of metal stampings. Many progressive manufacturers have cut cost of component parts up to 75% by converting from castings to stampings. Savings of 50% are common.

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Refining Molybdenum

Electrolytic preparation of th critical refractory metal hc proved successful

SUCCESSFUL electrolytic prep ration of molybdenum, a critic refractory metal for high-tempe ature applications, has bee achieved by National Bureau Standards in a research progra sponsored by Army Ordnan Corps. These experiments ha produced high-purity molybdenu by electrolysis of a bath of fus salts.

Process is flexible and easily co trolled. Depending on the cond tions of electrolysis, deposits var from fine powders to thick, c herent layers.

Furthermore, with further deve opment of the process, electroform ing of molybdenum objects ma become feasible, says NBS. Mo rapid, less expensive methods f producing molybdenum parts an coatings and for extracting th metal from the ore may result fro this work.

Interest in Refractories — Nee for heat-resistant materials in var ous applications has stimulate interest in refractory metals suc as tungsten and molybdenum. A present, molybdenum is produce chemically as a fine powder b reducing purified molybdic oxid with hydrogen. This process, ho ever, is expensive and has a nun ber of other disadvantages. Th molybdenum is obtained as a ver fine powder, and size of particle cannot be controlled satisfactoril in this form.

Because of fineness of th powder, a large surface area i exposed to oxidation; extensiv purification is thus required. Com plicated powder-metallurgy proc dures are also necessary to fab ricate the powder into molybd num objects.

Disadvantages Eliminated — Elimination of disadvantages i brought about by using the ele trolytic method, says the NBS, b cause the deposits are obtaine directly on the cathode in the de sider physical form and in a ver pure state. Applications of th method for electrowinning, electr refining, electroforming and ele

's Expensive, But

is grinding wheel, for use in a nterless grinding operation, is the st expensive ever made by Norton ., Worcester, Mass. Made for nerican Lava Corp., the wheel was ounted and dynamically balanced on arbor. Diamond depth is ⅛ inch. w grinding costs, high production h the wheel justify the $25,000 ecision grinding of hard ceramics gh first cost, says American Lava

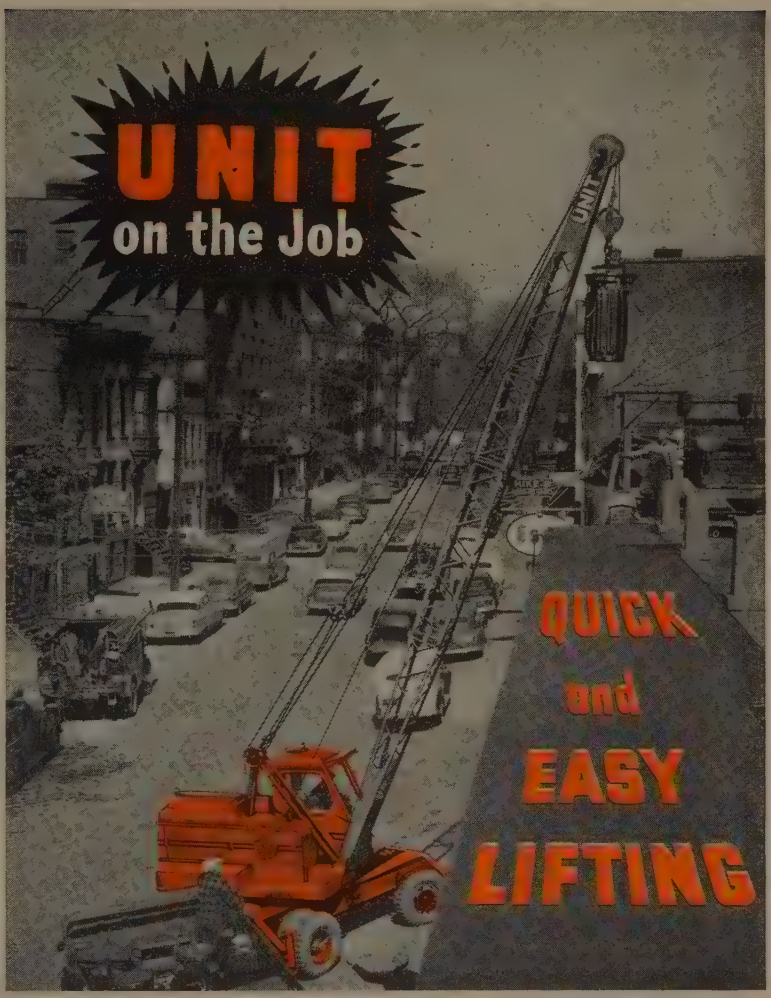
---

oplating are also under study at is time.

Electroforming would make pos-ble the formation of molybdenum rts having complicated shapes. olybdenum electroplating would ve the advantage of conserving is metal, and at the same time ow the designer to take advan-ge of properties of the basic etal.

Further Studies—The NBS work molybdenum was part of a gen-al program of research which the reau is conducting in an effort develop methods for electrode-siting in good physical form met-s such as tungsten, titanium and rconium which have not been de-osited from aqueous solutions.

Electrode potential studies were rried out on systems of the type ectrolyzed after a reference elec-ode half-cell suitable for use with olten salts was developed. These udies not only provide informa-on on the physical chemistry of olten electrolytes, but also in-cate that the NBS process might successfully adapted to the elec-orefining of molybdenum.



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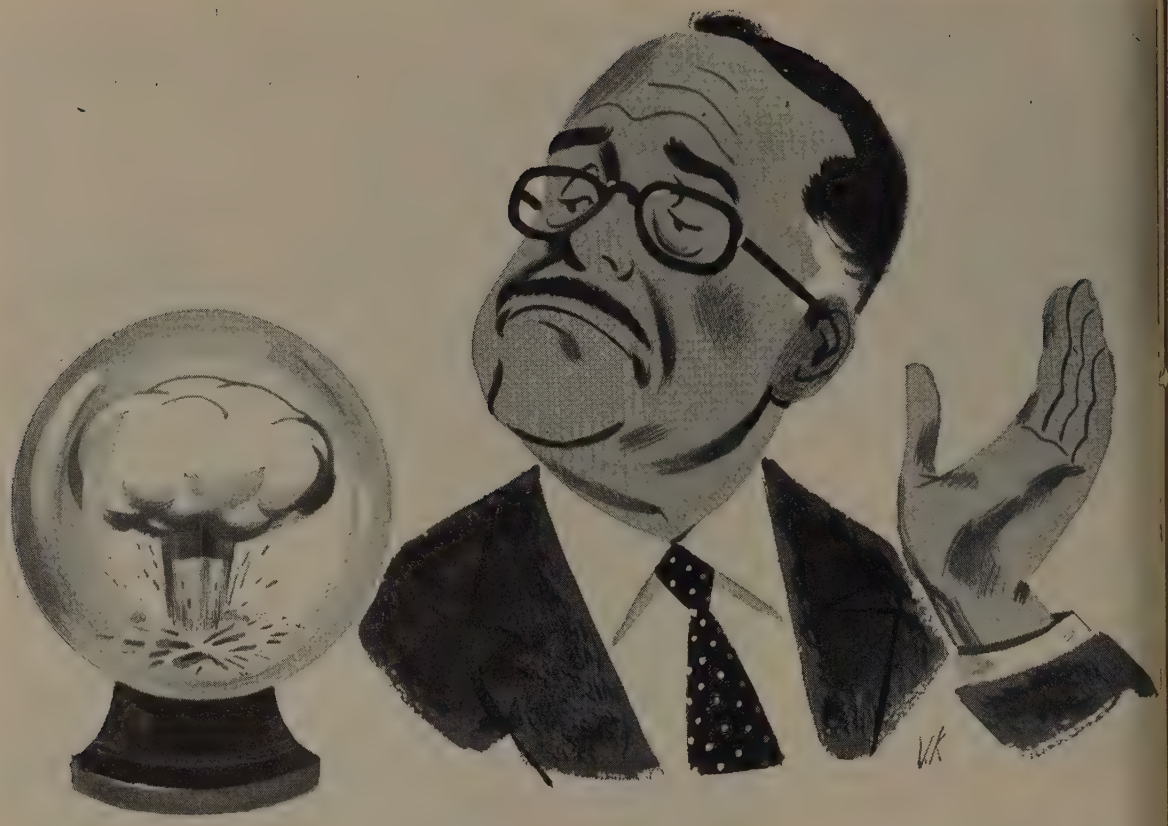

FAMOUS LAST WORDS:

"it may never happen"

True—and let's hope it never does. But the moment when we're least expecting it would be the best moment for an aggressor to attack. And the atom bomb isn't the only emergency that may hit us. Fires, floods, explosions, tornadoes also strike with little or no warning. Be ready for disaster, whatever form it takes. Do these simple things TODAY:

- ☐ **Enlist the help of your local Civil Defense Director.**
- ☐ **Check contents and locations of first-aid kits.**
- ☐ **Send staff to Red Cross courses. They may save your life.**
- ☐ **Promote preparedness in your community. Your local CD Director can show you how.**

Set the standard of preparedness in your plant city—check off these four simple points NOW.

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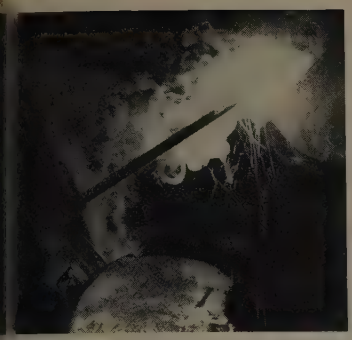

igh-Speed Electrode

t suited for work on mild and med- carbon steel, this new contact ctrode is designed for welding chinery, low pressure storage tanks d light structural work. Developed General Electric Co., Schenectady, w York, it is said that more metal deposited per unit of arc energy h this rod. The company says up 80 per cent less spatter develops

tomation Bushed

Automation has been successly applied to the process of oducing tractor track link bushgs by National Automatic Tool . of Richmond, Indiana.

A new Holesteel, automatic, mulle spindle, vertical indexing maine for core drilling and reaming es the job on six different size ack link bushings in the same achine. Bushings range from 5 hes to 8¼ inches in length, 3 inches to 2⅝ inches O.D. and 375 inches to 1.781 inches I.D. pending upon the size of bush- being run, the machine facilies production from 270 to 400 rts per hour estimated gross proction, based on 85 per cent of aximum capacity.

nual Doehler Award

The American Die Casting Institute, appointed as trustee for e Annual Doehler Award Fund, nounce the 1954 contest.

The award is made annually for e outstanding contribution to e advancement of the die cast- industry, or to the art of die sting as represented by technil achievement, achievement in ant operations, and other actives. The award itself consists of suitable plaque and a cash honarium of at least $500. Deadline r nominations is Apr. 15.

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STEEL

March 1, 1954

Market Outlook

DON'T LET all of the gloomy aspects of the steel market mislead you. There are some bright ays.

It's true that March hasn't shaped up as well in the steel business as it had been expected o. Some substantial reductions are being made n steel plant operations, and the national steel production rate is down 2 points. But those events are merely reflecting conditions that had their making weeks or months ago. What's in he making now for later this year? Sometimes people miss the turn in the trend of events because they are so overwhelmed with the present.

BAROMETER?—One steel company which believes its plant locations and its product mix make it an exceptionally good barometer is just beginning to note a strengthening in demand for its products. Last year that company noticed a downturn before most people were aware a decline was in the making for the steel business. In the summer of 1949 when a recession was causing much consternation this company began to see an improvement in demand for its products and said, "We think the turn upward in the country's business conditions has come." The company had correctly sensed that the inventory correction was over. Some months later it was evident the company was right.

AN OUTLOOK—The general manager of sales of another steel company believes the second quarter will be the best one this year for the steel business, the third quarter will be about the same as the first, and the fourth quarter will be down from the third. Net result? Production of 95 million net tons of ingots by the steel industry, he expects. If time proves him to be correct, this year would be the fourth largest steel production year on record.

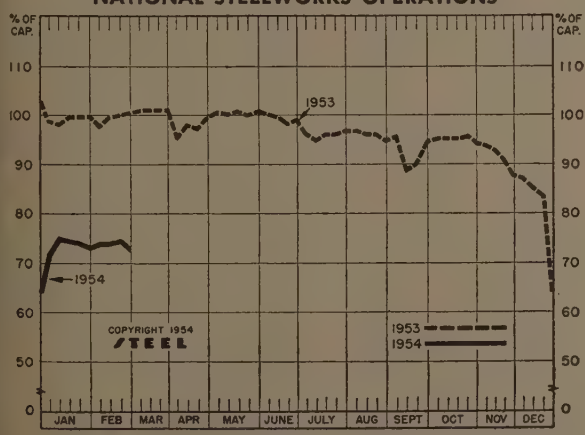
PRICE FIRMNESS—Evidence that steel sales, while down from their peak, have not gone to pot is the firmness of standard prices. Reflecting this firmness, STEEL's price composite on finished steel is $113.91 per net ton for the tenth consecutive week.

Meanwhile, steel ingot production is reflecting the easing in demand for steel. In the week ended Feb. 28, output declined 2 points from the preceding week and registered 72.5 per cent of capacity.

OUT OF THE MARKET—The decline in steel demand apparently is sharper than the decline in consumption. Many users are still living off inventories. In the East, a user of cold-rolled steel sheets who consumes about 10,000 tons of them a year has 5000 tons on hand. Another consumer, working 44 hours a week and using 250 tons of cold-rolled sheets a month, has 1800 tons of them in stock.

WELL STOCKED—With those people, and others like them, out of the market for steel, the raw material from which steel is made is piled high. As a result, prices of steelmaking scrap slipped further and dropped STEEL's price composite on steelmaking grades $1.33 a gross ton in a week, making the new composite $25.50 a ton, lowest since September, 1949. With a fourth of the nation's blast furnaces out of production, the stocks of iron ore at lower lakes docks and furnaces were phenomenally high for Feb. 1: 41,974,242 gross tons, enough for six months.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Feb. 28	Change	Same Week 1953	Same Week 1952
Pittsburgh	83.5	— 2*	106	102.5
Chicago	82.5	— 3*	103	104
Mid-Atlantic	72	— 2	95	98
Youngstown	74	+ 4	106	105
Wheeling	68	— 8	101	100.5
Cleveland	73.5	— 4.5*	103	95
Buffalo	68.5	— 4.5	106.5	104
Birmingham	80	0	98	104
New England	58	— 7	89	82
Cincinnati	71	— 3.5	95.5	89
St. Louis	43.5	+10	94	85.5
Detroit	72	0	104.5	103.5
Western	80.5	+ 1.5	109	106
National Rate	72.5	— 2	100.5	101

INGOT PRODUCTION‡

	Week Ended Feb. 28	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	107.7†	110.7	112.2	139.4
NET TONS (In thousands)	1,730†	1,779	1,802	2,240

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 43 Technical Outlook—p. 93

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Feb. 23

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.473
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454
Axles, railway	7.250	Bars, reinforcing	4.863	Pipe, galv., buttweld (100 ft)	17.567
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.940	Pipe, line (100 ft)	141.960
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	‡
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.875	Tubing, mechanical, stainless, 304 (100 ft)	161.193
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548	Tin plate, hot-dipped, 1.25 lb	$8.4
		Sheets, electrical	9.000	Tin plate, electrolytic, 0.25 lb	7.1
		Strip, C.R., carbon	7.243	Black plate, can making quality	6.2
				Wire, drawn, carbon	7.7
				Wire, drawn, stainless, 430 (lb)	0.5
				Bale ties (bundle)	5.8
				Nails, wire, 8d common	7.4
				Wire, barbed (80-rod spool)	6.7
				Woven wire fence (20-rod roll)	16.0

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Feb. 23 1954	Feb. 16 1954	Month Ago	Feb. Average
(1947-1949=100)	140.9	140.9	141.3	140.9

STEEL's FINISHED STEEL PRICE INDEX

	Feb. 25 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	151.86
Index in cents per lb	5.140	5.140	5.140	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Feb. 25 1954	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Finished Steel, NT	$113.91	$113.91	$113.91	$110.98	$97.77
No. 2 Fdry, Pig Iron, GT.	56.54	56.54	56.54	55.04	46.62
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.22
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	25.50	26.83	28.17	43.00	37.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 84; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 25 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.20	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.20	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.175
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.475-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Feb. 25 1954	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	60.16	60.16	60.16	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$27.50	$28.50	$30.50	$44.00	$39.00
No. 1 Heavy Melt, E. Pa.	24.00	25.00	27.00	41.50	39.50
No. 1 Heavy Melt, Chicago	25.00	27.00	27.00	42.50	34.00
No. 1 Heavy Melt, Valley	24.50	25.50	29.50	44.00	37.75
No. 1 Heavy Melt, Cleve.	21.50	23.50	28.50	43.00	37.25
No. 1 Heavy Melt, Buffalo	25.00	25.00	25.00	42.75	39.50
Rails, Rerolling, Chicago	36.50	36.50	38.00	52.50	45.75
No. 1 Cast, Chicago	29.50	29.50	32.50	43.00	41.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 12.30, chemical 12.40, corroding 12.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $188-$191 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Feb. 25	Change		Previous Price	Jan. Avg.	Dec. Avg.	Feb. 1953 Avg.
Copper	29.50-30.00	Oct.	20	29.00-30.00	29.750	29.750	25.136
Lead	12.30	Feb.	18	12.80	13.060	13.300	13.300
Zinc	9.25	Feb.	15	9.50	9.760	10.000	11.431
Tin	85.25	Feb.	25	85.00	85.100	84.913	121.500
Nickel	60.00	Jan.	14	56.50	60.000	60.000	60.000
Aluminum	21.50	July	15	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar.	9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, deld.; Magnesium 99.8%, Freeport, Tex.

for addition to cast iron, 60.00; prices Port Colborne, Ont., including import New York basis, add 0.92.

m: $140-$150 per troy oz nom.

lium: $22-$24 per troy oz.

um: $91-$93 per troy oz from refineries.

m: $16-$21.50 per mg radium content, ding on quantity.

um: $125 per troy oz.

nium: $75-$80 per troy oz.

um: 99.5%, $5-$6 per lb.

m: 16.50, carlots; 17.00 l.c.l

dum: Sheet, rod $39.00 per lb; powder) per lb.

dum: $1.75 per lb.

um: $12.50 per lb.

(Straits, New York, 85.25.

lum: Sponge, 99.3+ %, $5 per lb.

nten: Powder, 98.8%, carbon reduced, lb lots $4.95 per lb f.o.b. shipping point; than 1000 lb $5.10; 99+ % hydrogen re- , $5.85. Treated ingots $7.95.

Prime Western 9.25, brass special 9.50, mediate 9.75, E. St. Louis, freight al- over 0.50 per pound. High grade 10.60, ll high grade 10.75, die casting alloy 13.25, deld.

nium: Sponge $10 per lb; powder elec- s grade $15, flash grade $11.50.

: Chromium, manganese and silicon met- re listed in ferroalloy section.)

CONDARY METALS AND ALLOYS

inum Ingot: Piston Alloys 18.75-19.50; 12 foundry alloy (No. 2 grade) 18.25- 5% silicon alloy, 0.60 Cu max., 21.50- 13 alloy, 0.60 Cu max., 21.50-22.00; alloy 20.50-21.00; 108 alloy 19.00-19.50; deoxidizing grades, notch bars, granu- or shot: Grade 1, 19.50-20.00; grade 2, 19.00; grade 3, 17.00-17.50; grade 4, 17.00.

Ingot: Red brass, No. 115, 23.50; tin e No. 225, 34.25, No. 245, 28.50; high- tin bronze, No. 305, 27.75; No. 1 , No. 405, 19.75; manganese bronze No. 24.25.

esium Alloy Ingot: AZ63A, 31.50; AZ91B, AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

soft, f.o.b. eastern mills, 100,000 lb lots, 30,000 lb lots, 35.43; l.c.l. 35.93. Weath- of, 100,000 lb, 36.23; 30,000 lb, 36.53; 37.03. Magnet wire deld., 15,000 lb or 41.83; l.c.l., 42.58.

LEAD

s to jobbers f.o.b. Buffalo, Cleveland, urgh.) Sheets, full rolls, 140 sq ft or $17.50 per cwt; pipe, full coils $17.50 vt; traps and bends, list prices plus 30%.

TITANIUM

es per lb, 100,000 lb and over, f.o.b. mill.) s, $15; sheared mill plate, $12; strip, $15; $10; forging billets, $6; hot-rolled and l bars, $6.

ZINC

1 23.00, f.o.b. mill, 36,000 lb and over. n zinc in coils, 19.50-20.50, f.o.b. mill,) lb and over. Plates 19.00-22.25.

ZIRCONIUM

$27; H.R. strip $28; C.R. strip $35; l or H.R. bars $27; wire, 0.015 in., 1 per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
C.R. ...	86.5	67.5	92.5
C.R. ...	92.5	70.5	98.5
H.R. ..	84.5	66.5	90.5
Shapes ..	82.5	65.5	88.5
es Tubes	115.5	100.5	137.5
Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.5	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	——Round—— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¼	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 22.50; No. 2 copper 20.50-21.00; light copper 18.50-19.00; No. 1 composition red brass 16.00-16.50; No. 1 composition turnings 15.50-16.00; mixed brass turnings 10.00-10.50; new brass clippings 15.50-16.00; No. 1 brass rod turnings 11.00-11.50; light brass 9.50-10.00; heavy yellow brass 11.50; new brass rod ends 13.50-14.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets 13.50-14.00; brass pipe 15.00.

Lead: Heavy 9.50; battery plate 5.00-5.50; linotype and stereotype 12.00; electrotype 10.50; mixed babbitt 11.00-11.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.25; new die cast scrap, 3.00; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 13.50-14.00; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 12.00-12.50; mixed clippings 12.00-12.50; old sheet 10.50-11.00; old cast 10.50-11.00; clean old cable, free of steel 13.50-14.00; borings and turnings 10.50-11.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 20.00; auto radiators, 13.75, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50-23.00; light copper 21.00-21.50; No. 1 composition borings 17.50; No. 1 composition solids 18.00; heavy yellow brass solids 14.00; yellow brass turnings 13.00; radiators 14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-5000 lb 11.35; 5000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00, 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-500 lb 53.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.131; 100-300 lb $1.031; 400-900 lb $1.007; 100-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 88.5; 20,000 lb and over 82.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

S MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
r	48.38b	45.98c	....	48.44	26.000	26.000	25.250
y Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
nercial Bronze, 90% ..	46.95	46.89	47.49	49.51	23.375	23.625	23.125
l Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
hor Bronze, A, 5% ...	66.58	67.08	67.08	68.23	26.125	25.875	24.875
n Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
anese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
: Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. ee cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

Competition from imported brass mill products is overplayed. What really hurts domestic mills, and importers, too, is drop in buying by consumers who await price cuts

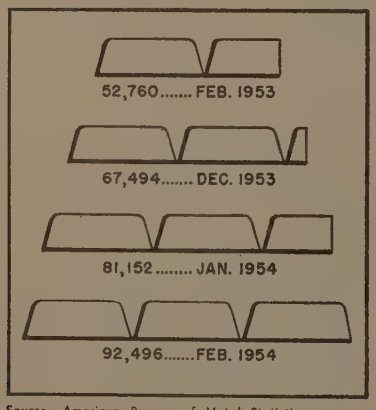
TEMPEST in a teapot has been stirred up by complaints against import competition in brass mill products. Much the same can be said of imported aluminum semifabricated products, cause of similar squabbles in recent months.

In reality, the situation is distorted far out of proportion to its economic importance. True, some brass mills are operating at half-capacity while their customers' operations are only off 10 per cent or less. But it's accounted for more by emptying of pipelines in anticipation of price declines than by cut-rate imports. A spot survey by STEEL shows importers are suffering more from the market softening than domestic mills.

Here's one common way the import threat is magnified. Small brokers trying to crack the market send out broadcast offers to companies listed in industrial directories. Lure offered is a saving of 15 to 25 per cent in price. Buyers, even if they don't take the bait, usually tell their supplier's salesman about it. Even though no sale is made, the word gets around and many people think the importers are getting all the business.

GETTING HEAVIER

LEAD STOCKS at primary refineries at beginning of month (net tons)



Source: American Bureau of Metal Statistics

The Facts—Latest Commerce department statistics show December imports of brass mill products totaled 1800 tons. That's only 1.6 per cent of average monthly shipments in 1953. Aluminum mill product imports last year (about 35,000 tons) were only 2 per cent of total domestic shipments. Last year incoming shipments reached their crest; even importers doubt if they'll go higher this year.

Brass rod is the big tonnage item coming in. In December brass rod, sheet and plate led the list with 1072 tons, followed by seamless tube (333 tons), copper sheets, rolls and rods (322 tons) and copper seamless tube (73 tons). Clad metals are well up the product list, but exact figures are not available. Brass wire accounted for about a quarter-ton; it's kept out by an import duty of 12.5 cents ad valorem, which means a 5-cent levy on 40-cent wire.

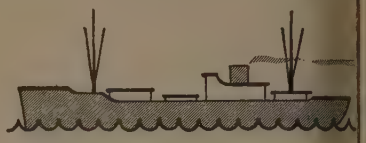
In contrast a 2-cent-per-pound duty is levied on brass tube, rod and sheet, while copper tube is taxed 3.5 cents a pound and copper sheets 1.25 cents. Aluminum sheets and coils have a 3-cent-per-pound duty while aluminum tube duty is 22.5 per cent ad valorem.

Price or Service—To sell U. S. fabricators, importers must offer incentive in the form of price or a product they can't buy here. Unless a discount of 10 per cent or more can be made, purchasing agents as a rule don't consider the deal sufficiently attractive. Big orders aren't a sizable factor in the market. The deliveries are extended—about 8 weeks ex mill for brass rod, which means about 12 weeks to your plant—and you're not protected from price drops, as European mills quote fixed price as of order date.

Thus importers usually steer clear of tonnage items, pushing specialty items with high labor value.

Discounts—Brass rod today is offered at 29 cents a pound, compared with U. S. quotations of 34.50 cents. Brass tubing is quoted at discounts of 10-15 per cent under U. S. levels. Diameters of 1.25 in. and 1.50 in. with wall thickness between 0.025 in. and 0.045 in. range from 46 to 52 cents. Complicating buyers' figuring is the fact that European sellers quote net price instead of base price plus size extras. Also, because prices are based on metal acquisition costs, they fluctuate from week to week. Copper sheet and strip offer little competition to U. S. companies with their high-speed mills. Best price offered is about 5 per cent under domestic rates.

In buying abroad you may get an immediate price break but can lose in terms of delivery and total price. A powerful weapon of domestic brass mills is in scrap buying. The price spread is so wide because losses on selling scrap must be accounted for. In screw machine operations, for example, about half of the weight purchased is generated into turnings. U. S. mills refuse to buy scrap not generated from their own rods, and disposal becomes a problem. If the scrap is shipped back to Europe, packing and shipping costs are about 5 cents a pound. If sold to dealers, the turnings bring 6 cents a pound under mill purchase price.



U. S. TIN IMPORTS RISE

(Long Tons)

	1953	1952
Tin in concentrates	35,973	26,491
Pig tin	74,535	80,543
Total	110,508	107,034

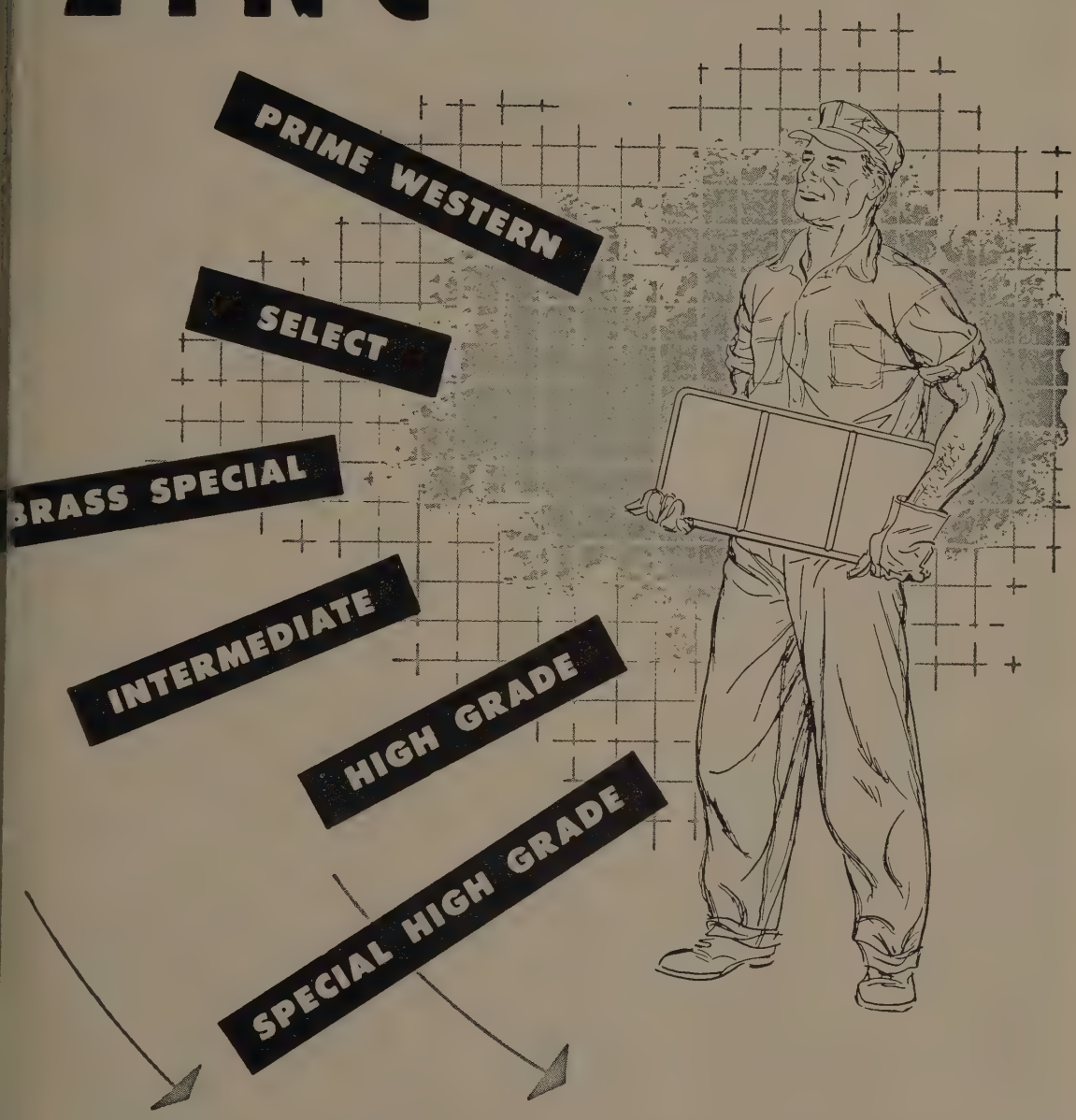
Source: U. S. Department of Commerce

Watch Your Step—Purchasing pitfalls in dealing directly with foreign mills are many. You must pay in advance by letter of credit, and the mill collects when your order is put aboard a vessel. Collection of claims can be difficult.

A cardinal rule in buying imported goods: Deal with reputable importers. They get better deliveries from mills and guarantee what they sell. They sell on open-account terms to all rated accounts. Thus you can inspect the material and make sure it's suitable before paying. Here are some tips on buying mill products from Howard Fromson, Fromson-Orban Co. Inc.: Make sure the seller is financially responsible. Insist on knowing what mill you're doing business with. Demand material test certificates to assure you're getting correct alloy and physical properties.

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 157. Key to footnotes, page 159.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa, Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo,R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ...4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14..4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.10
Lackawanna,N.Y. B2 ...4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor, Ind. Y1 ...6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

PILING

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity, Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 ....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 ....4.10
Conshohocken,Pa. A3 ..4.10
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ...4.10
LoneStar,Tex. L6 ....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ...6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.55
Coatesville,Pa. L7 ....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 .....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12,R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ...5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13..5.20
Hartford,Conn. R2 ....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 ....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie,Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 .....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2,M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ....6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth.Mich. P5 ....6.525
So.Chicago,Ill. R2,W14.6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Yougstown F3, Y1 ....6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So. SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.50
Marion,O. P11 .....5.55
Seattle N14 .....5.50
Seattle B3 .....5.55
So.SanFrancisco B3 ....5.55
SparrowsPt. ½-1" B2 ..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 .....4.25
ChicagoHts.(3) C2, I-2.4.05
ChicagoHts.(4) C2, I-2..4.15
FortWorth,Tex.(26) T4..4.65
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 ...4.15
Williamsport,Pa.(3) S19.4.50
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1..3.925
Irvin,Pa. U5 .....3.925

o,Ind. C16 ....4.025
wanna,N.Y. B2 ..3.925
ll,Pa. U5 .....3.925
rt,Ky. N9 .....3.925
. N12 .....5.175
rg,Calif. C11 ...4.625
rgh J5 .....3.925
outh,O. P12 ...3.925
ale,Ill. A1 .....3.925
.,Pa. S3 .....3.925
cago,Ill. W14 ...3.925
wsPoint,Md. B2..3.925
nville,O. W10 ...3.925
ce,Calif. C11 ...4.625
n,O. R2 .....3.925
n,W.Va. W6 ....3.925
stown U5, Y1 ...3.925

H. R. (19 gage)
naCity,Ala. R2..5.225
O. R1 .....5.05
ao,Ind. C16 .....5.025
ield,O. E6 .....5.05
O. N12 .....4.775
ce,Calif. C11 ....5.875

, H.R. (14 ga. heavier)
l-Strength Low-Alloy
and J5, R2 .....5.90
hocken,Pa. A3 ..5.90
,Mich. G5 .....6.10
eld,Ala. T2 .....5.90
na,Calif. K1 ....6.675
ind, U5 .....5.90
arbor,Ind. I-2 ....5.90
arbor,Ind Y1 ....6.40
Pa. U5 .....5.90
wanna(35) B2 ..5.90
all,Pa. U5 .....5.90
urgh J5 .....5.90
a,Pa. S3 .....5.90
cago,Ill. U5 .....5.90
owsPoint(36) B2 ..5.90
n,O. R2 .....5.90
on,W.Va. W6 ....5.90
gstown U5 .....5.90
kstown Y1 .....6.40

S, Hot-Rolled Ingot Iron
(Gage and Heavier)
nd.Ky.(8) A10 ...4.175
and R2 .....4.525
arbor,Ind. I-2 ...4.175
n,O. R2 .....4.525

S, Cold-Rolled Steel
mmercial Quality)
oort,Pa. P7 ....4.775
and J5, R2 .....4.775
e,Mich. G5 .....4.975
eld, Ala. T2 ....4.775
ess,Pa. U5 .....4.875
asbee,W.Va. F4 ..4.775
na,Calif. K1 ....5.875
Ind. U5 .....4.775
teCity,Ill. G4 ....4.975
arbor,Ind. I-2,Y1.4.775
Pa. U5 .....4.775
wanna,N.Y. B2 ..4.775
etown,O. A10 ....4.775
burg,Calif. C11 ...5.725
urgh J5 .....4.775
mouth,O. P12 ....4.775
owsPoint,Md. B2..4.775
eenville,O. W10...4.775
n,O. R2 .....4.775
on,W.Va. W6 ....4.775
gstown Y1 .....4.775

S, Cold-Rolled
h-Strength Low Alloy
land J5, R2 .....7.225
ve,Mich. G5 .....7.425
ana,Calif. K1 ....8.275
Ind. U5 .....7.225
naHarbor,Ind. Y1.7.725
Pa. U5 .....7.225
awanna(37) B2 ..7.225
ourgh J5 .....7.225
owsPoint (38) B2.7.225
en,O. R2 .....7.225
on,W.Va. W6 ....7.225
gstown Y1 .....7.725

S, Cold-Rolled Ingot Iron
land R2 .....5.375
letown,O. A10 ....5.275
en,O. R2 .....5.375

S, Culvert	Cu Alloy	Cu FE
and,Ky A10	6.325	....
on,O. R2	6.475	6.925
ield T2	6.075	6.325
Ind. U5	6.075	6.325
arbor I-2	6.075	6.325
,Pa. U5	6.075	6.325
mo,Ind. C16	6.175	....
insFry.,O.W10	6.075	....
.,Calif. C11	6.825	....
owsPt. B2	6.075	....
ance,Cal. C11	7.075	....

S, Culvert	Pure Iron
and,Ky. A10	6.575
ield,Ala. T2	6.325
insFerry,O. W10	6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ... 5.275
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Galvanneale d Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel
Bulter,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Bulter,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ..5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 ....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2.3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 ....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Bridgeprt,Conn.(10) S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklirPark,Ill. T6 ..5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ...5.75
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md, B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 ElectroMetallurgicalCo.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible SteelCo.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15.	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8.	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	...	8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	....
Zanesville,O. A10	...	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
GraniteCity,Ill G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville, O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35†
Warren,O. R2	....	....	....	....	12.35†

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 1.50 Coke (Base Box)	lb	4b
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb

Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt., Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8"Coils)

Alton,Ill L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)

Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo, W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead

Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark, Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo. S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O. P12	6.675 ....
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Sterl'g(1)(48)N15	6.675 7.175
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.

Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	144
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	142

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	17
SparrowsPoint,Md. B2	15
Sterling,Ill.(1) N15	14

WIRE, Barbed

	Col.
AlabamaCity R2	153*
Aliquippa J5	150
Atlanta A11	15
Bartonville,Ill. K4	15
Crawfordsville,Ind. M8	15
Donora,Pa. A7	153
Duluth,Minn. A7	153
Fairfield,Ala. T2	153
Houston,Tex. S5	16
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	16
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159*
Monessen,Pa. P7	15
Pittsburg,Calif. C11	173
Rankin,Pa. A7	153
So.Chicago,Ill. R2	153*
S.SanFrancisco C10	176*
SparrowsPoint,Md. B2	158
Sterling,Ill. (1) N15	15

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

	An'ld. Galv	Stone Stone
WIRE, (16 gage)		
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass. W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.26
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	158

LESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

-Inches	2		2½		3		3½		4		5		6	
er Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
s Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
opa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
dge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
stown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

TRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

stown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

-Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
er Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
s Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
opa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
od, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	..	....	..	....	...	....	....	....	....
Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
s, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
a, Calif. K1 (§)	..	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
arbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	...	....	....	....	....
, Pa. M6	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
ws Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
stown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
stown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.76	19.5
land, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.76	19.5

-Inches	2		2½		3		3½		4	
er Ft	37c		58.5c		76.5c		92c		$1.09	
s Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
opa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
od, W.Va. W10(††)	35.25	20.75	36.76	20.5	36.75	20.5	27.75	11	27.75	11
Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
ss, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
na, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
, Pa. M6	35.25	21.5	36.75	21	36.75	21	....	....	....	....
ws Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
stown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
stown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
land, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

alvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

ER TUBES

ase c.l. prices, dollar per 100 ft, mill; minimum thickness, cut lengths 10 to 24 ft, inclusive.

	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
	13	....	19.02	18.44
	13	....	22.53	18.12
	13	20.65	24.91	20.01
	13	24.40	29.43	23.66
	13	27.34	32.98	26.51
	13	30.80	37.15	29.86
	12	33.43	40.32	32.41
	12	36.82	44.41	35.70
	12	39.87	48.09	38.66
	12	42.52	51.28	41.23

WAY MATERIALS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
mer, Pa. U5	4.325	4.225	4.275	5.20
y, Ala. T2	4.325	4.225	.....	5.20
ield, Ala. T2	....	....	....	5.20
Ind. U5	4.325	4.225	4.275	...
ington, W.Va. W7	....	....	....	5.20
naHarbor, Ind. I-2	4.325	4.225	4.275	...
stown, Pa. B2	....	....	...(16)	5.20
awanna, N.Y. B2	4.325	4.225	....	5.20
equa, Colo. C10	4.325	4.125	....	5.70
ton, Pa. B2	4.325	4.225	....	...
amsport, Pa. S19	....	....	....	5.20

PLATES

ield, Ala. T2	5.125
, Ind. U5	5.125
Harbor, Ind. I-2	5.125
awanna, N.Y. B2	5.125
equa, Colo. C10	5.125
burg, Calif. C11	5.275
le B3	5.275
ton, Pa. B2	5.125
ance, Calif. C11	5.275

K BOLTS (20) Treated

eland R2	11.00
saCity, Mo. S5	11.00
non, Pa. B2	11.00
equa, Colo. C10	11.00
burgh O3, P14	11.00

T BARS

emer, Pa. U5	5.275
field, Ala. T2	5.275
Harbor, Ind. I-2	5.275
t, Ill. U5	5.275
awanna, N.Y. B2	5.275
equa, Colo. C10	5.275
lton, Pa. B2	5.275

ES

Harbor, Ind. S13	6.50
stown, Pa. B2	6.50

STANDARD TRACK SPIKES

Ind, Harbor, Ind. I-2, Y1	7.05
KansasCity, Mo. S5	7.30
Lebanon, Pa. B2	7.05
Minnequa, Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So. Chicago, Ill. R2	7.05
Struthers, O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 4
- ⅝-in. & ⅝-in. 5
- ¾-in. and larger ... 3

Longer than 6 in.: All diams. ..... +4

Lag bolts, all diams.:
- 6 in. and shorter.... 12
- Over 6 in. long. 8

Ribbed Necked Carriage 5

Blank 25

Plow 25

Step, Elevator, Tap and Sleigh Shoe 12

Tire Bolts ..... List

Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy: Square, all sizes 58

H.P., Hex, regular & heavy:
- ⅝" and smaller 58
- ⅞" to 1⅛", inclusive. 60
- 1¼" to 1½", inclusive 62
- 1⅝" and larger 58

C.P. Hex, regular heavy: All sizes 58

Hot Galv. Nuts (all types):
- ¾" and smaller 40
- ⅞" to 1½", inclusive. 43

Finished Hex Nuts: New standard, all sizes 58

Semifinished & Slotted Hex.: Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 34

1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34

¼-in. diam. & larger .. 14

N.F. thread, all diams... 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish ..... 47.5 & 10

Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 38
- ¾-in. through 1 in. .. 22

Longer than 6 in.:
- ⅝-in. and smaller ... 20
- ¾-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed.	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots.	32.00*
Brass, 20-ton lots.	29.25-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	43.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin	14.00*
Zinc, 10-ton lots.	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over...	4.95
Less than 1000 lb ..	5.10
Chromium, electrolytic 99.9% Cr min.	3.60

*Plus cost of metal.

Footnotes

(1) Chicago base.
(2) Angles, flat, banda.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter. 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths. to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	....	.....	46.00	....

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22; Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.33
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	3.875
18.25	4.25	1	4.75	...	2.160-2.320
18	4	2	9	...	2.515
18	4	2	....	...	1.640
18	4	1	....	...	1.480
13.5	4	3	....	...	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON

Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	.....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wimerding,Monaco, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U6	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	62.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

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	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.12	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.27	6.71	7.36	6.56	7.60	12.12	6.93	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50[6]	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.35	7.13	7.90	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.15	7.25	7.35	9.40
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Price Tone Weakens at Warehouse Level

Concessions are being made in some districts, particularly on hot-rolled carbon sheets, bars, plates and structurals. Distributors expect a sales pick-up in March

Philadelphia—Price sniping is noted in the warehouse market, particularly in hot-rolled carbon sheets, bars, and merchant pipe. However, except for pipe, cutting hasn't developed to a point where it has affected the quotations of the major sellers. Meanwhile, business is a little better, with distributors generally looking to March to show further gains.

Boston — Steel warehouse order volume in February was about equal to that in the preceding month. Orders are small, but are fairly numerous for fill-in needs. More price shading is apparent at the warehouse level. Involved are galvanized sheets, plates, structurals and pipe.

Chicago — Warehouses estimate their inventories at about 110 per cent of normal as regards total tonnage, but some imbalance continues in certain products. Essentially it is wide flange beams and heavy sheared plates that need improvement. Current demand indicates that consumers are nearing the end of inventory reduction.

Pittsburgh — Warehouse salesmen are bringing in an increasing number of orders from small fabricators. Sentiment is that production has stabilized.

Warehouses can fill virtually all orders promptly.

Cleveland—Sentiment is somewhat mixed among district warehouse operators with respect to current demand and business prospects. With some, February volume bettered that of January, but others did not do so well. Generally, March is thought likely to bring some improvement in sales, depending upon further clearing away of customers' inventories and a noticeable pickup in manufacturing operations. Building steel, it is said, will move in better volume from here on with spring approaching.

Warehouse prices are unchanged but they are under considerable pres-

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Some distributors are absorb- freight in meeting competition, cially where they ship outside immediate home market. At same time, customers are play- one supplier against another in effort to obtain more favorable s, this being noticeably the case ose instances where seconds are ed in competition with prime erial.

ncinnati—Warehouses are experi- ng better business. February will an improvement over January.

attle—Warehouse operators re- buying developing slowly but cations promise an active spring. ntories are in best shape in rs. Plates and sheets are in le supply. Wide flange sections reported easier.

inforcing Bars . . .

Reinforcing Bar Prices, Page 156

hicago—Fabricators and produc- of reinforcing steel products are ing forward to an active demand spring. Their view is supported the considerable volume of high- , bridge and general construction k projected for this year.

ol Steel . . .

Tool Steel Prices, Page 160

New York — Shipments of high ed and tool steel (excluding hol- drill steel) totaled 8069 net tons December, reports the American n & Steel Institute. This was light decline compared with ship- nts of 8263 tons in the preced- month, but was off sharply from 9525 tons shipped in December, 3.

Actually, shipments were the allest for any month since July, 2, when operations were curtailed a steel strike.

Total shipments for 1953 amounted 116,152 net tons, comparing with 1,967 tons in 1952, and 176,014 ns in 1951.

Comparative data are given in the lowing table:

SHIPMENTS OF HIGH SPEED & TOOL STEEL

(Excluding hollow drill steel)
(Net Tons)

nths 1953	
uary	9,769
ruary	10,046
rch	10,782
ril	11,525
y	10,863
ne	11,505
ly	8,569
gust	9,270
otember	8,580
tober	9,496
vember	8,263
cember	8,069
Total 1953	116,152
1952	121,967
1951	176,014

Bethlehem Steel Enlarges Ore Unloading Facilities

Recent 1000-ft extension of the ore dock basin at its Sparrows Point, Md., plant enables Bethlehem Steel Co. to unload with greater facility the 7 million tons of iron ore it receives annually. It is possible to unload three ocean-going vessels simultaneously (as shown above); a fourth vessel (extreme right) prepares to leave after discharging its cargo. A 15-ton ore unloader, a 20-ton combination ore unloader and bridge were added. Unloading capacity is 2880 tons per hour

Sheet Buyers Ordering Cautiously

Consumers purchasing for relatively prompt shipment with an eye to holding down their inventories. Some quickening in demand expected as first quarter nears close

Sheet and Strip Prices, Page 156 & 157

New York—While consumers' inventories generally are above normal, sheet sellers are encouraged by the fact a number of shops are maintaining 40-hour-per-week operations and in some instances are on overtime schedules.

Sellers here are booking a little better volume of business for March than they did for February, and on a daily basis. Also, April buying got off to a better start than for any month so far this year. Sheetmakers, consequently, are confident April volume will be the best up to that month.

Contributing to better April prospects is the outlook for a further substantial reduction in consumers' inventories. However, these will still represent no little problem. For instance, one local fabricator of cold-rolled sheets which consumes about 10,000 tons annually, still holds close to 5000 tons in stock. A much smaller fabricator here, working 44 hours per week and consuming at that rate around 250 tons monthly, has 1800 tons of cold-rolled sheets on hand, stored in part outside its plant.

Boston—Sheet and strip orders for second quarter mirror slow inventory reduction and but slight gain in consumption. Flat-rolled steel consumers will use less tonnage than expected in the first three months.

With the exception of galvanized in some cases, carryover volume will be nil Apr. 1. Reduced rolling schedules for March are barely filled and some carbon grades can still be booked for shipment this month.

Demand for higher nickel stainless is slightly heavier, mostly for government requirements. Other alloys are slow.

Philadelphia—Somewhat significant in the market is betterment in demend for electrical sheets required for fractional horsepower motors. This is taken to indicate demand for household durables, requiring such motors, is showing more life, and this is further supported by better business in both hot and cold-rolled carbon sheets.

Alan Wood Steel Co. has broken ground for its new $6 million cold-rolled strip mill at Ivy Rock, near Conshohocken, Pa. The mill will have annual capacity of 120,000 tons. It will be in operation next year.

Pittsburgh—Encouraging news to sheetmakers last week was the decision of a major automaker to increase its ordering, instead of an expected cutback. Predictions of improving sales to appliance producers are not yet reflected in increasing production rates. Sheetmakers continue to press hard for sales.

Cleveland—Sheet consumers are continuing to order virtually on a month-to-month basis and no early

change in this type of specifying is anticipated soon. Inventory-conscious buyers, assured of prompt shipments from the mills, are not finding it necessary to order far in advance. Meanwhile, demand is reported only slightly better with inventory reduction still in progress among many consumers.

Youngstown — Although no new avalanche of orders is indicated, the steel industry's outlook for business in March reportedly is looking up.

Chicago — Sheetmakers see little pickup in demand for their product before April. Further reduction in automobile assembly schedules has dissipated hope that March volume would exceed that of February. Many consumers still find it possible to live off their inventories.

Inland Steel Co. has reduced its galvanized sheet price $1 per ton, from 5.325c to 5.275c, effective Feb. 17. The company heretofore has maintained a differential over the major producer in the district.

Steel Bars . . .

Bar Prices, Page 156

Philadelphia—Hot-rolled carbon bar specifications are slightly more active as reflected particularly in 10 and 14-inch mill sizes. Most producers anticipate better production in March, not only because there will be a greater number of working days, but because they think the daily average will be a shade better. However, facilities will not be pressed. Consumers should have no difficulty getting what they want in any size, shape or type, and fairly promptly. This also applies to cold-drawn bars. One leading cold drawer is able to supply anywhere from 45 to 50 per cent of the business coming his way from stock in any size or shape. In some instances, particularly in alloys, deliveries are fairly extended. Where particular specifications are not in stock so that they can be readily drawn, delivery promises are extended as much as 60 days.

Boston—Bar mill schedules, on a lower rolling basis for March, filled slowly, both carbon and alloy. Bulk of buying is for fill-in requirements for prompt shipment and consumers are not building up inventories.

Pittsburgh — Several consumers have worked through inventories of large size bars, but ordering is generally slow. March volume is expected to be on about the same level as that of February.

Cleveland—Not much change is noted in the bar market. Carbon bars are reported in stronger demand than cold-finished, and especially alloy grades. However, demand is not pressing and prompt shipment is available, in the case of cold-drawn reportedly from mill stocks. Alloy grades are weak, to some extent this reflecting switchback to regular carbon grades by consumers.

Chicago—Stronger demand for bars is confined to farm equipment where production schedules are being stepped up moderately by several large companies. This pickup, however, is more than offset by easing requirements from the automotive industry which has further revised downward projected assembly schedules.

Plates . . .

Plate Prices, Page 156

New York—Tank business is stepping up a trifle, reflecting not only seasonal influences but also the working off of excess stocks at some consumers' plants. In certain instances, users' stocks are on the low side, as indicated by current rush demands.

March should prove a better month for most producers, and April will show still more improvement. Some tank fabricators say another two or three weeks should make quite a difference in the amount of work coming out.

Particularly weak spots, insofar as plate demand is concerned, are the ship and railroad equipment industries. Little new work is in prospect in either line.

Boston — Carbon plate deliveries can be made in three weeks, most head sizes in four and clad plates in seven weeks. Some producers can ship this month. Structural fabricating shops are well stocked, tonnage having been shipped ahead of schedule by at least one mill.

An unsettling factor involves some distressed tonnage offered by a secondary seller as low as 3.00c.

Philadelphia—Plate business here shows little if any gain. Actually there is less life than in any other major product at the moment. District mills on an average are operating at far below normal.

Pittsburgh — Slowup in demand from the construction industries may be partially seasonal. All sizes of plates and most standard structural shapes are easily obtained, causing fabricators to order less plate than they are using.

Seattle—Plate fabricating shops in this area are involved in a union dispute which has closed a number of plants during the past month.

Tin Plate . . .

Tin Plate Prices, Page 158

San Francisco—The American Can Co. is expected to enter the soft drink can field by midyear.

Structural Shapes . . .

Structural Shape Prices, Page 156

Cleveland — Structural fabricators in this area anticipate an active building season. Considerable work is reported on drawing boards and with steel supplies easier to obtain than for a long time past it is expected some postponed work will be coming into the market. Substantial volume of public work is before the trade, as well as a considerable number of industrial jobs. Standard structurals are readily available from the mills but wide flange beams continue tight, though supply conditions are less stringent than some months back.

Boston — New specifications for welded bridge work here where federal financing is involved is increasing, through extras, bearing and cover plates $14 and $4 per ton respectively. State financed bridges do not require this specification, drawn to improve welding connections.

Fabricating shops exert less pressure for plain standard shapes. Inventories in some cases are heavy. Wide flange beams are booked well ahead.

New York—Though structural contracting continues spotty, there is a livelier tone to the market. Somewhat more inquiry is out and while much of the work involves small jobs with builders inclined to shop around, indications are business for March will be the best since December, which was an exceptionally good month for that time of the year.

Philadelphia—Structural steel inquiry is improved but orders continue spotty. A leading award involves 1900 tons for Medical Center buildings at Temple University here.

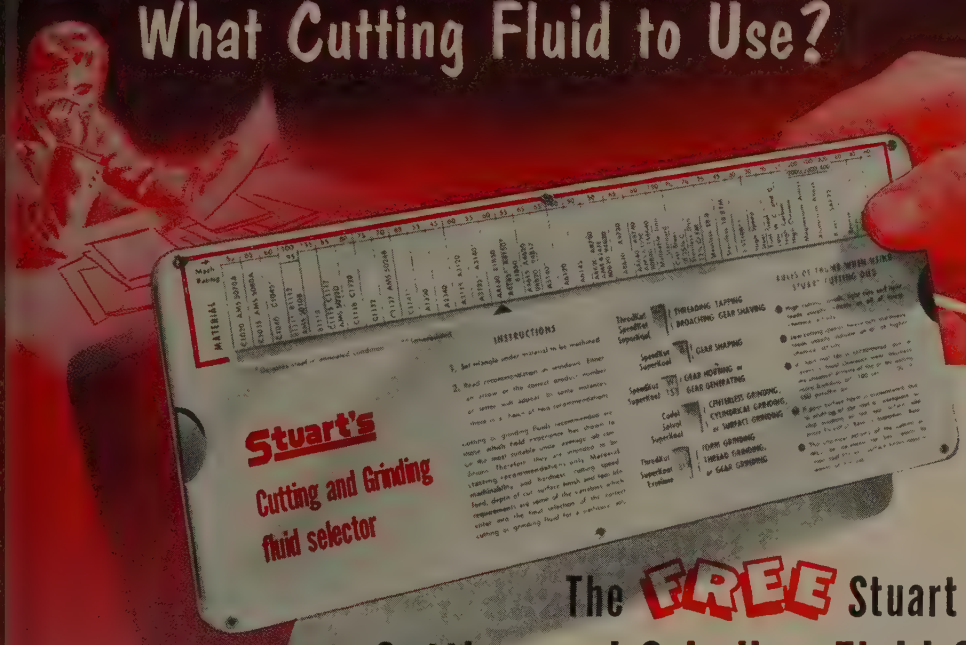
Wire . . .

Wire Prices, Page 158

Boston—Wire bookings for March fall far short of capacity volume. Orders for numerous items can be filled this month. Most buying is for prompt shipment. Forward commitments are small including cold-heading alloys and some specialties. Automotive spring and cold-heading wire demand is below expectations.

While most consumers have worked down inventories, they are not building stocks, largely buying for replacement and stressing delivery.

What Cutting Fluid to Use?



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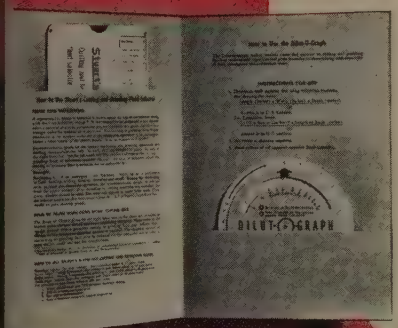

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Tubular Goods . . .

Tubular Goods Prices, Page 159

Pittsburgh—Buttweld production is unchanged entering March, at about 70 per cent of capacity. Despite growing inquiries, customers are reluctant to place larger orders.

Boston—Seamless pipe demand, 6 to 10-inch, is lower. Until now seamless in these sizes has held up well. Distributor stocks of merchant pipe are substantial and buying is held to replacements. Price equalization is general, including stainless against Watervliet, N. Y., base. Pipe fabricating shops are reducing inventories to a 6 weeks basis.

Los Angeles—Demand for small diameter pipe and tubing is sustained. Inquiry is steady from petroleum interests.

Seattle—Improved demand for cast iron pipe is noted but in the vicinity of Seattle two projects which would have involved 1300 tons of cast iron went to steel because of difference in cost. Bellingham, Wash., and Eugene, Oreg., are calling bids for about 250 tons of cast iron each.

Five tramp steamers are reported chartered to freight part of the steel pipe required for the Haines-Fairbanks, Alaska, pipeline.

To Extend Delivered Pricing

Cleveland—Announcement is expected shortly by Republic Steel Corp. of extension of its new delivered pricing system to all its major products.

The new pricing method was applied last December to hot-rolled carbon bars. It has worked out so well the company now is getting ready to apply it throughout its product list.

The new system eliminates computing headaches attending determination of delivered prices under the f.o.b. mill pricing system, base prices being established at the company's various producing points, and then delivered prices set up for each county in the country taking into consideration freight and trucking rates from the nearest mill to point of delivery.

It is understood Republic will issue a universal code list for each state which will be applicable to virtually all of its products. The state lists will not be issued simultaneously, but beginning within the next several weeks they will come out over a period of weeks so that within a relatively short time code lists for each state in the union will be in the hands of customers.

Series No. 4B12 Steelweld Shear. With more than a half century of experience in steel warehousing, Enos & Sanderson know what good shearing is. They are proud of this machine. They advertise that: "Trained shearing teams will give you the finest edge ever cut with this Steelweld".

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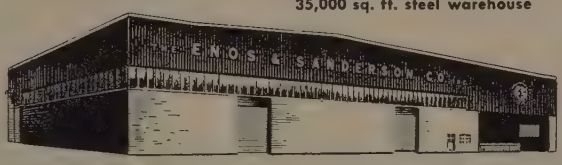
Steel Warehouse Elated with Steelweld Shear

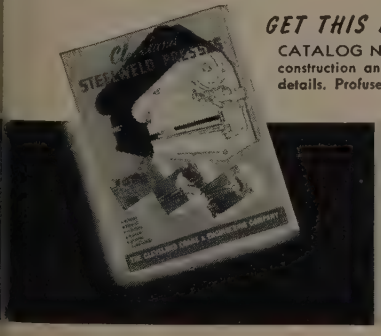
For 57 years The Enos & Sanderson Company, Buffalo, N. Y. has been supplying steel sheets and plates to hundreds of Niagara Frontier factories. Recently they installed a Steelweld Shear in their new warehouse. This is used for cutting various thicknesses to 1/4" x 12', as per customer orders. Cuts must be smooth, straight and accurate. Speed is essential to provide best service possible.

Enos & Sanderson's new 35,000 sq. ft. steel warehouse



The following paragraph in an unsolicited letter from Enos & Sanderson indicates how well their Steelweld Shear is serving their needs:

"We are extremely satisfied with the operation of this unit and would recommend this machine highly to anyone. A rigger, who set up this shear for operation, remarked that, in his twenty-five years of work with shears of all types, he had never seen a smoother operating shear in his experience."



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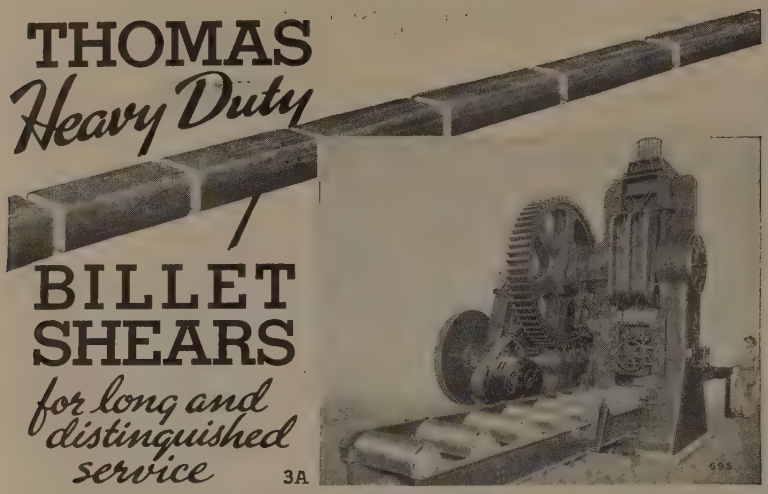

THOMAS *Heavy Duty* Billet Shears are built in capacities from 500 to 2000 tons, with the primary objective of delivering to the user many years of efficient, trouble-free service. *And they do!*

Write for Bulletin 311

PUNCHES • SHEARS • PRESSES
BENDERS • SPACING TABLES

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MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

KNOWN FROM COAST TO COAST FOR CRANES OF
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MICHIGAN CRANE
YOUR BEST BUY . . . COMPARE THESE FEATURES
Every Michigan crane combines precision engineering and manufacturing with such important features as anti-friction bearings at all moving points on bridge and trolley, optional fluid couplings, and easily replaceable standard mill parts used throughout! Why not consult with our staff of material handling experts on your particular problem, with no obligation or cost?
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115 McKINSTRY AVENUE • DETROIT 9, MICHIGAN

Scrap . . .

Scrap Prices, Page 182

Philadelphia—Steel scrap prices continue to slump badly, with No. 1 heavy melting steel, No. 1 bundles and No. 1 busheling all down to $24, delivered consumer plant. The reduction in the latter two grades is nominal, in sympathy with the decline in No. 1 which resulted from some limited business.

No. 2 heavy melting declined to $20 to $21 delivered, and No. 2 bundles to $18 to $19. Electric furnace bundles dropped $2 per ton to $25 on light trading. Low phos structurals and plate sold at $28 delivered against a spread of $30 to $31 recently. Heavy turnings are off nominally to $21. Couplers, springs and wheels and rail crops are unchanged.

Cast iron grades are unchanged and fairly strong, at least in relation to open-hearth grades of steel scrap.

Boston — Collapse of steel scrap prices is emphasized by the fact No. 1 heavy melting steel was selling $19 to $20 per ton higher early last March. Secondary grades are off even more.

Buying at current low prices is at standstill. Yard intake and operations are down with most tonnage against old contracts shipped.

Cast grades also are moving in limited volume, but pricewise are steadier than steel scrap after a long period of softness.

New York—Brokers' buying prices are off further on most steel grades and are largely on a nominal basis as trading is almost at a standstill. Only in the cast grades does there appear to be any stability.

No. 1 heavy melting and No. 1 bundles are now $16 to $17, No. 2 heavy melting $13 to $14, and No. 2 bundles $11 to $12. Machine shop turnings have been marked down to $4 and mixed borings and short turnings to $7 to $8. Low phos and short shovel turnings are unchanged.

Buffalo—While the general market in scrap remains weak advances of $1 per ton were posted for cast iron and shoveling turnings. However, steelmaking grades remain soft with buying absent.

Pittsburgh—Sales increased moderately as prices continued to drop. No. 1 heavy melting is priced at $27 to $28. Prospect of March improvement in steel operations may encourage greater purchases.

Cincinnati—There has been no new buying here. Lower prices in other districts are reflected in Cincinnati quotations. Open hearth and cast iron grades have been reduced nominally

. ton. No. 1 railroad heavy melt- has been reduced $3 a ton. Rails, lom length, are quoted $1 lower.

eveland — Steelmaking scrap es continue to sink. Some pro- ion material is moving on direct ment to mills but dealer scrap feless and quoted prices, in the nce of sales, largely are nominal, cting trade views of what ma- al would bring were a consumer enter the market with a repre- ative inquiry.

o. 1 heavy melting steel is quot- ere at $21 to $22, off about $1 a week ago. Other steel and t furnace grades are down ac- lingly. Significantly, however, motive and other large produc- scrap lists are moving at prices o $2 per ton above those quoted he dealer market.

aterial is piling up in dealers' ds and prospects are bleak for y resumption of heavy buying by steel mills. Foundry grades of p are reported moving in fair me with prices relatively stable.

etroit—Turnings which had been emely slow in this area of late e followed into the doldrums last k by heavy melting grades. es quoted, therefore, are largely inal.

oungstown—The scrap market e is in a sad state with dealers ing against hope that the big el producers soon will re-enter the rket for substantial tonnage. Many lers' yards are loaded to over- wing.

Major consumers are living off in- tories or supplies of home scrap, l at present rates of operations st do not need to go into the mar- for dealer scrap.

hicago—Steelmaking scrap prices ve weakened further in face of t demand. No. 1 heavy melting el of industrial origin is off $2 to a ton and No. 1 factory bundles the same amount to $27. A lead- mill bought sparingly at these es for March delivery.

No. 2 heavy melting is quoted at 2 and the supply appears to be ying up, dealers finding it unprofit- le to prepare it under present con- ions.

Birmingham—Further weakness in e district scrap market developed t week with disclosure that Repub- Steel Corp., largest mill user cur- ntly in the market, had further duced its buying prices.

Seattle — From the dealers' view- int the scrap market situation is ghly unsatisfactory. With the mar- t $25 and $21 for No. 1 and No. 2 avy melting steel, respectively,

World's largest stocks of

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STEEL TUBING and BARS

TUBES Warehouse and mill shipment with more than 200 seamless tube sizes to choose from .950" O. D. to 8.750" O.D.

BARS In sizes from .171" round to 8.750" round. Warehouse and mill shipment.

WIRE Mill shipment of hot rolled or cold drawn ball, roller and needle wire.

FORGINGS Quick shipment of all analyses.

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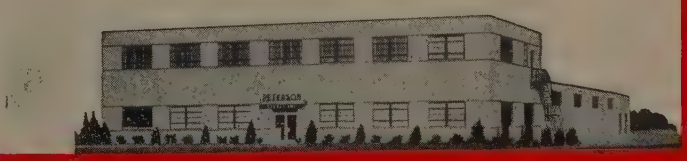
Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. S.



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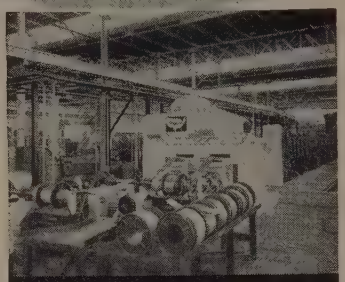
UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

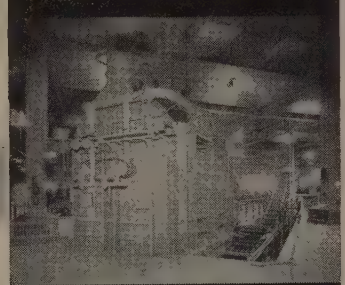
The over-all job in

Production Lines and Special Automatic Machines by CONTINENTAL

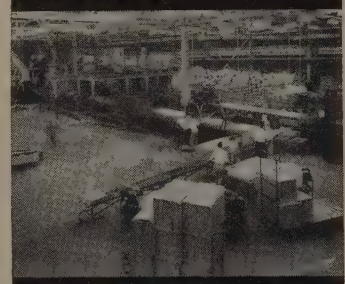
for military production . . .



Continental Automatic Strip Production Line consisting of annealer, pickling machine, dryer, and coiler.



Continental Special Automatic Pig Molding Machine complete with automatic charging, melting, and pouring.



Continental Automatic Production Line operating from raw materials to completely finished and packed product. This production line consists of fifteen integrated, synchronized, special automatic machines.

Continental Special Automatic Glazing Machine complete with automatic press synchronizer and fire polisher.

For maximum production of military items manual operations must be eliminated. With CONTINENTAL Special Automatic Machines and Integrated Production Lines production goes on in a continuous flow with better, more uniform products with a minimum of man hours.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and the installation of the machines—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

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176 W. Adams Street, Chicago 3, Illinois
District Representatives:
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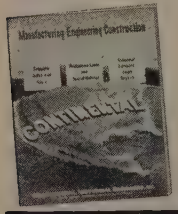


PLANNED MILITARY PRODUCTION. Write for Booklet No. 127.

FURNACES PRODUCTION LINES
CONTINENTAL
SPECIAL MACHINES COMPLETE PLANTS
MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

large buyers are downgrading. Mills are in position to pick and choose.

Los Angeles—With one district mill completely out of the market and two others buying lightly, the scrap market is in the doldrums.

San Francisco—The steel scrap market is suffering from a complete lack of interest by consumers.

Washington — Stocks of ferrous scrap held by consumers on Dec. 31, 1953, totaled 6,386,000 gross tons, the highest on record, reports the Bureau of Mines. Pig iron stocks held by consumers and suppliers, 2,499,000 tons, increased for the eighth consecutive month in December and established a new record high for the sixth straight month.

The percentage of scrap used in the total charge of ferrous materials (scrap and pig iron) ranged from a high during 1953 of 53 per cent in February, March and April, to a low of 48 per cent in December. The average percentage of charge was 51 for the whole year.

Pig iron consumption in December totaled 5,091,000 gross tons, the lowest since August 1952, and a decrease of 234,000 tons from the preceding month.

Total scrap available to consumers (home scrap produced and purchased scrap received) was 4,988,000 gross tons, a decrease of 101,000 from November. Of these materials, 62 per cent was home scrap, 29 per cent was the net purchased scrap received from dealers, and 9 per cent was received from other sources.

Consumption of ferrous scrap during December amounted to 4,689,000 gross tons and was the lowest since July, 1950, exclusive of the strike months of June and July 1952.

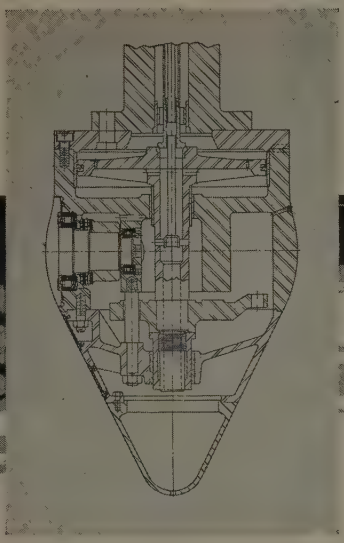
Pig Iron . . .

Pig Iron Prices, Page 160

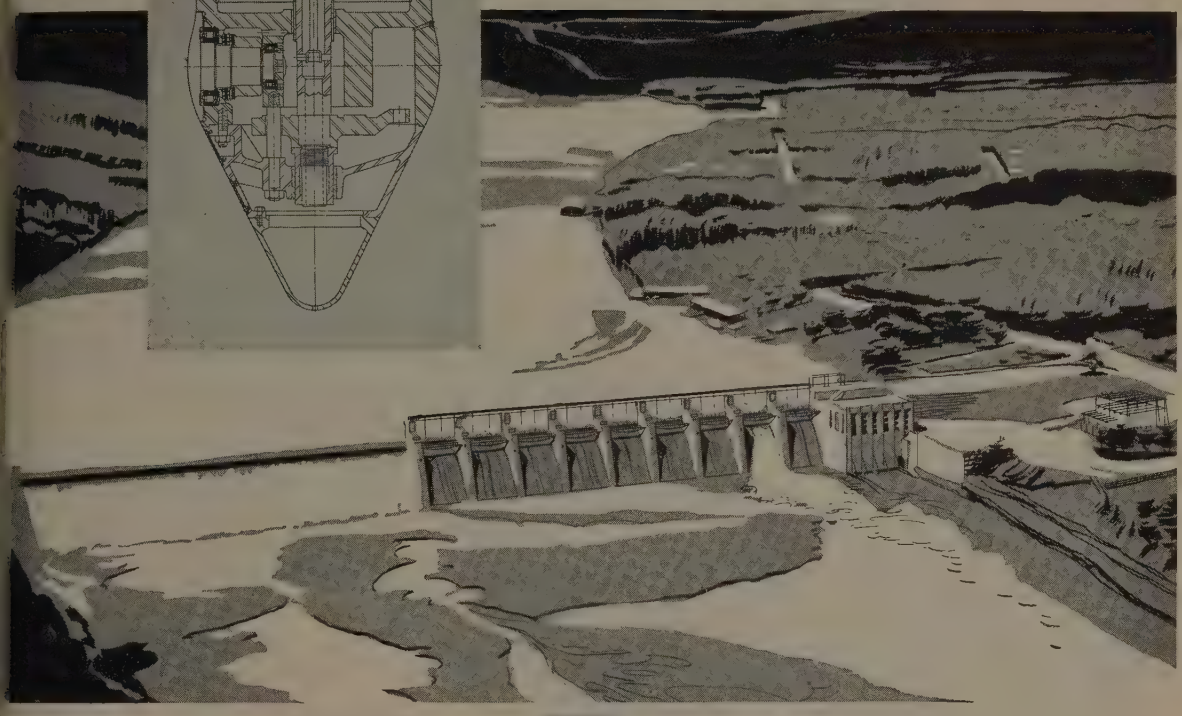
Chicago—Even a mild general increase in demand for ferrous castings would bring a fast quickening in demand for pig iron. This is because foundries, jobbing shops in particular, have reduced their inventries to minimum. Foundry operations are spotty, ranging from 3 to 5 days. Farm implement requirements are up a little, machine tool and automotive down. Inland Steel Co. banked its Indiana Harbor No. 2 furnace Feb. 14 leaving only 34 of the district's stacks producing.

New York—Dullness continues to dominate the pig iron market. Casting production at most district plants still lags, which, in turn, means light pig iron consumption.

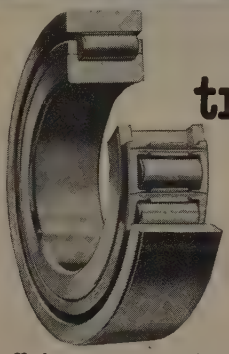
Boston—Melt of all grades of pig iron is off slightly. Foundry opera-



TORRINGTON Radial Roller Bearings and Roller Thrust Bearings installed in turbine-blade runner hubs at Texas' Austin Dam demonstrate the versatility and efficiency of precision-ground TORRINGTON Bearings. Installation by Newport News Shipbuilding & Drydock Company.



Fifteen years of trouble-free service!



The two Newport News adjustable blade turbines installed at Texas' Austin Dam in 1939 were equipped with TORRINGTON Bearings in the runner hubs. Today, *fifteen years later*, those bearings are still giving efficient, trouble-free service.

And little wonder. For TORRINGTON Bearings are precision ground from the finest of bearing-quality steels. They are carefully heat treated by the most advanced metallurgical methods. In most designs their one-piece cages are cast of bronze and are *land-riding*.

In every kind of heavy-duty application, TORRINGTON Bearings assure high load-carrying capacity, maximum rolling efficiency and resistance to shock and wear.

Next time you specify bearings, choose TORRINGTON. You'll find the type to meet your requirements.

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.

TORRINGTON RADIAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

Vertical curve of Universal Cable Conveyor inclines to convenient work height, utilizes overhead space.

BUSCHMAN CONVEYOR
costing only $3800.00
SAVES $7000.00 ANNUALLY
at
MINNEAPOLIS-Honeywell

Conveyor carrier has three hooks. Placement of regulator valve on any hook indicates operations to be performed.

A BUSCHMAN OVERHEAD CABLE CONVEYOR SYSTEM replaces former manual handling method at MINNEAPOLIS-HONEYWELL REGULATOR CO. with resulting savings of $7000.00 annually on an investment of $3800.00. This does not include recovered floor space, reduced aisle traffic, easier working conditions and increased production.

It is anticipated that the overall total savings that will be realized by Minneapolis-Honeywell improved production methods in this instance is approximately $16,000.00 per year.

Smoother, reduced-handling operations on continuous flow, high production lines with comparable savings are being accomplished with BUSCHMAN Overhead Cable Conveyors in hundreds of plants in all industries. Why not investigate the possibilities of similar savings in your plant operations?

Write for NEW Bulletin No. 40

Representatives in Principal Cities

THE E. W. BUSCHMAN CO.
4496 Clifton Ave.
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PRODUCE MORE . . . FOR LESS with Buschman Conveyors

Canadian Licensee: A. McKechnie Ltd., Toronto 13, Canada

tions are 65 to 70 per cent, with basic consumers somewhat lower. While some smaller jobbing shops better this, they lack backlogs and casting orders are for early shipment.

Producers are equalizing freight with Troy, N. Y. Few shops are increasing the ratio of scrap to iron in their mixtures despite the low cost of the former. Risk of rejection is a factor for consideration in this.

Philadelphia—Pig iron producers continue to pile iron, production being in excess of demand, which so far this year has lagged badly. The larger of the two stacks at Swedeland, Pa., is expected to go down for repairs in April.

Pittsburgh — Merchant pig iron shipments improved in February from a slow January. Growth in orders centered in iron foundries. Total shipments remain low compared with a year ago.

Detroit—Ford Motor Co. has returned to service one of its three blast furnaces at the Rouge plant that has been down 4 months for major repairs.

Iron Ore . . .

Iron Ore Prices, Page 177

Cleveland—Consumption of Lake Superior iron ore in January totaled 6,995,621 gross tons, reports the Lake Superior Iron Ore Association. This was a decline of less than ½ of 1 per cent compared with consumption of 7,021,683 tons in the preceding month, but was off about 15 per cent from consumption of 8,292,585 tons in January, 1953.

The decline in use directly reflects the slump in blast furnace operations. In January there were 56 blast furnaces idle, 49 in this country and 6 in Canada. This represented about 27 per cent of the 204 total stacks. In December, 45 stacks were idle, 39 in this country and 6 in Canada, equaling 22 per cent of the number of stacks available. On the other hand, in January, 1953, only 9 stacks were idle, of which 6 were in the U. S. and 3 in Canada. This was equal to only 4 per cent of the total number of furnaces, 202, then constituting capacity.

Stocks of ore on Lake Erie docks and at furnaces on Feb. 1 amounted to 41,974,242 gross tons. This was a decline of 6,841,202 tons, or about 14 per cent, from stocks held on Jan. 1, but was an increase of 4,897,638 tons, or about 13 per cent compared with stocks on Feb. 1, 1953.

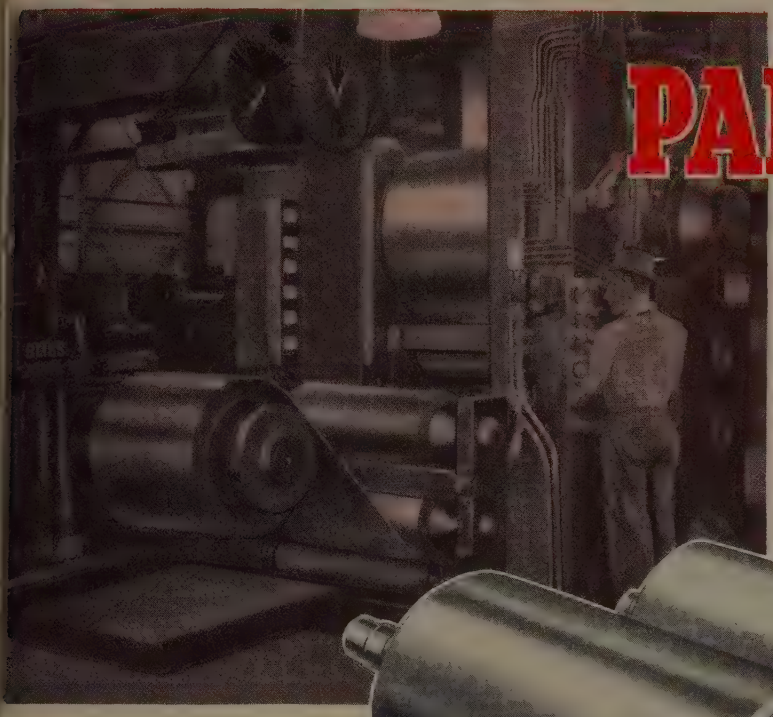
Boston — Whether the Interstate Commerce Commission's decision giving Baltimore and Philadelphia pref-

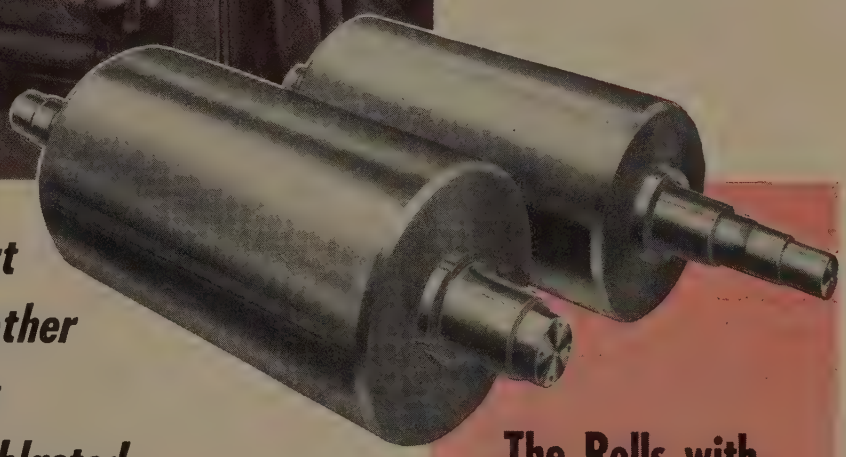
(*Please Turn to Page* 179)

Increase Production and Reduce Maintenance with Y&M

PARALLOY

Temper Mill Tension Rolls





- *Drive them apart*
- *Drive them together*
- *Run them bright*
- *Run them sand blasted*

This Bliss Temper Mill rolls more tons with Paralloy—the rolls of uniform hardness that cut temper mill maintenance cost. Users report 4-6 months service between grinds. If you are not getting good tonnage over your present rolls, or from any other material handling application—call "YOUNGSTOWN"—Strip Mill Maintenance Specialists

The Rolls with Uniform Hardness

500-600 BRINNEL
from New to Scrap Diameter

SCRATCHING
GALLING
PICK UP
MARKING

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

16

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.46c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-86%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon: No. 2: (Cr, 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, corload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-075%), Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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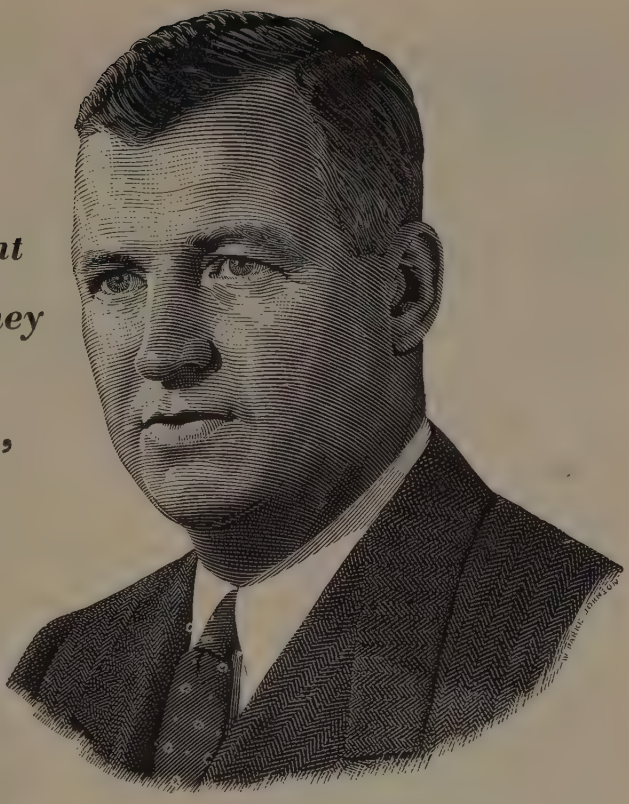

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President
Republic Aviation Corporation

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Here are a few facts and figures:

For every dollar of public debt held by a commercial bank, about five new dollars may be created in the form of credit. Obviously, the larger the amount of the public debt held by individuals, the greater the check on inflationary tendencies.

At the end of 1953, the cash value of Series E and H Bonds *held* by individuals was more than 36 billion dollars. This total is growing steadily, thanks largely to the month after month purchases of Series E Bonds by more than 7,000,000 Payroll Savers.

Sales of E and H Bonds in 1953—23% higher than in 1952—provided cash for *all* E and H Bond maturities and redemptions and still left over $210,000,000 *net* for the reduction of bank-held debt.

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THE WEEKLY MAGAZINE OF METALWORKING

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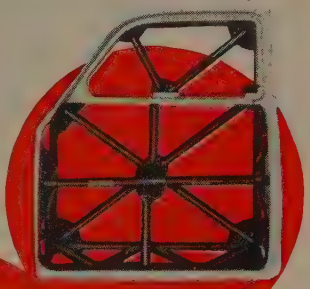

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anywhere . . . in one easy motion!

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Rockwell "A" 35-75 Scale	Rockwell "15N" 70-95 Scale
Rockwell "B" 5-100 Scale	Brinell Medium 100-440 Scale
Rockwell "C" 6-70 Scale	Brinell Low 50-260 Scale

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

rices effective July 1, 1953, and thereafter; oss ton, 51.50% iron natural, rail of vessel, ver lake ports.)

d range bessemer	$10.30
d range nonbessemer	10.15
sabi bessemer	10.05
sabi nonbessemer	9.90
en-hearth lump	11.15
gh phosphorus	9.90

e foregoing prices are based on upper lake ll freight rates, lake vessel freight rates, ndling and unloading charges, and taxes ereon which were in effect on June 24, 53, and increases or decreases after such te are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

undry and basic 56-62% concentrates
ontract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

edish basic, 60 to 68% 22.00
rth African hematite (spot) 20.00-22.00
azilian iron ore, 68-69% (spot) 25.00

Tungsten Ore

Net ton unit, before duty

reign Wolframite min. 60%, WO_3... 23.80
mestic scheelite, mine 63.00

Manganese Ore

, 48% nearby, $1.12 per long ton unit, .f. U. S. ports, duty for buyer's account; -47%, $1.05-$1.07.

Chrome Ore

oss ton, f.o.b. cars, New York, Philadel-ia, Baltimore, Charleston, S. C., plus ocean eight differential for delivery to Portland, eg., or Tacoma, Wash.:

Indian and African

% 2.8:1 ..... $40.00-$42.00
% 3:1 ..... 44.00-46.00
% no ratio 32.00-34.00

South African Transvaal

% no ratio ..... $24.00-$26.00
% no ratio 34.00

Domestic
(Rail nearest seller)

% 3:1 ..... $39.00

Molybdenum

lphide concentrate, per lb, Mb content
mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.l.f. seaboard

-60% ..... $2.40-$2.80
% min. ..... $3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

mestic 31.00

REFRACTORIES

Fire Clay Brick

gh-Heat Duty: Pueblo, Colo., $89; Ashland, rahn, Hayward, Hitchins, Haldeman, Olive ill, Ky., Athens, Troup, Tex., Beech Creek, earfield, Curwensville, Lock Haven, Lum-r, Orviston, West Decatur, Pa., Bessemer, a., Farber, Mexico, St. Louis, Vandalia, o., Ironton, Oak Hill, Parral, Portsmouth, , Ottawa, Ill., Stevens Pottery, Ga., Wood-idge, N. J., $109; Salina, Pa., $114; Niles, , $120; Los Angeles, Pittsburg, Calif., 32.30.

Silica Brick

tandard: Alexandria, Claysburg, Mt. Union, roul, Pa., Ensley, Ala., Portsmouth, O., 15; Warren, O., Hays, Pa., $120; Niles, O., 20; E. Chicago, Ind., Joliet, Rockdale, Ill., 25; Cutler, Utah, $116.55; Los Angeles, 22.85.

Insulating Fire Brick

00° *F:* Massillon, O., $178.50; Clearfield, a., $213; Augusta, Ga., Beaver Falls, Zel-iople, Pa., Mexico, Mo., $206; Vandalia, Mo., 14.10; Portsmouth, O., $207.50; Bessemer, la., $212.80.

Ladle Brick

ry Pressed: Bessemer, Ala., $64.60; Alsey, l., Chester, New Cumberland, W. Va., Free-ort, Johnstown, Merrill Station, Pa., Wells-lle, O., $77.50; Mexico, Mo., $73.50; Clear-eld, Pa., Portsmouth, O., $83; Perla, Ark., 09; Los Angeles, $110.25; Pittsburg, Calif., 11.30.

Sleeves

eesdale, Pa., $139.70; Johnstown, Pa., 140; Clearfield, Pa., $148.50; St. Louis, 51.80; Athens, Tex., $155.

Nozzles

eesdale, Pa., $223.50; Johnstown, Pa., 229.20; Clearfield, Pa., $241.40; St. Louis, 247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-47
Birmingham area	$45.00†

† With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars....	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

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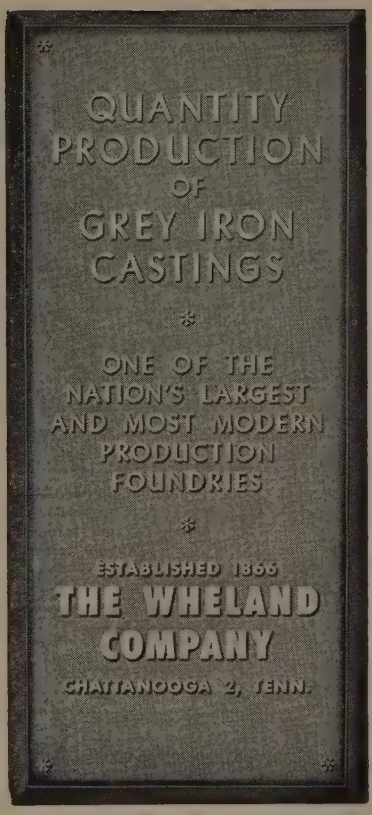
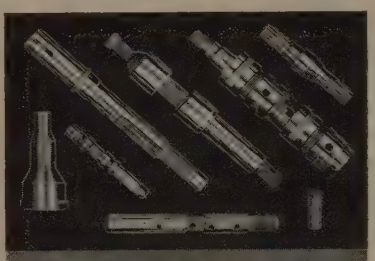
(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00
	CARBON	
40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55





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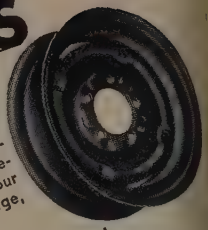

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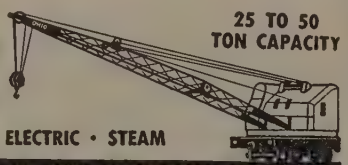

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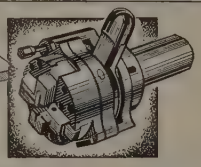

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The *Cleveland Steel Tool Co.*

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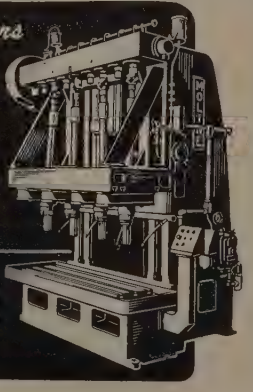

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No. HU68—Hydraulic rail and universal joint type multiple spindle drilling machine.

Versatility counts in

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any size or shape product, any size order from the smallest to the largest

Excellent facilities for pickling and oiling

ENTERPRISE
GALVANIZING COMPANY
2523 E. Cumberland Street Philadelphia 25, Pa.

ron Ore . . .

(*Concluded from Page* 172)

ential rail rates over New York d Boston in handling imported on ore is uncertain.

The 2 to 1 decision puts the Pennlvania, Baltimore & Ohio and estern Maryland railroads on an ual rate basis—60 cents a ton be- w lines linking New York and Bos- n with the steel producing areas ound Wheeling, W. Va., Steubenlle and Youngstown, O.

emifinished Steel . . .

Semifinished Prices, Page 156

Youngstown — Steelmaking operaons here are up slightly, currently eing estimated at 74 per cent of apacity.

A 44-inch blooming mill at the rier Hill Works of Youngstown heet & Tube Co. has resumed opration after something of a rehabilitation speed record. Crews tore out ne old 40-inch mill built in 1913, nd erected the new unit in its place n only 18 days.

Chicago — Republic Steel Corp. ade over-due motor and electrical pairs last week on its 44-inch looming mill and 36-32-inch billet nd bar mills. During the five days ese facilities were shut down openearth furnaces also were idled.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 177

Washington—December coke production, totaling 6,093,009 net tons, was off 2 per cent from November output, reports the Bureau of Mines.

Of total output in December, 5,194,867 tons were oven coke and 298,442 tons beehive. In November oven coke output totaled 5,894,447 tons, and in December, 1952, it was 6,290,700. Beehive coke output in November amounted to 313,708 tons and in December, 1952, it was 432,400 tons.

Oven coke stocks at the end of December totaled 2,727,020 tons, equal to 14.6 days production. This compares with 2,657,729 tons or 13.5 days, at the end of November, and 1,877,265 tons or 9.2 days at the end of December, 1952.

Production of oven and beehive coke in 1953 totaled 78.5 million net tons, 15 per cent more than in 1952 but nearly 1 million tons under the record output of 1951. Oven coke output alone, however, set a new peak at 73,261,139 net tons. These exceeded the previous record set in 1951 by 1.3 million tons.

Beehive coke output slumped badly in the closing months of 1953, and while output for the year of 5,206,-

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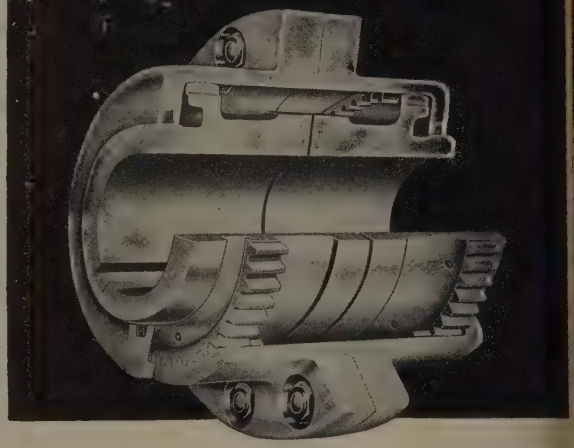

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7 tons was up 18 per cent over at for 1952, it was 2.1 million tons der that produced in 1951.

During 1953 the industry experi- ced one of the best construction ars since World War I. The Mines reau's preliminary figures show 57 new ovens with annual capacity 5.8 million tons were placed in eration. Net gain in capacity is timated at 4 million tons for the ar, with total capacity rated at pproximately 80 million tons.

anada . . .

Toronto, Ont.—Production of iron d steel in Canada set a new record 1953 despite a sharp decline in tput during December.

During the closing month of the ar pig iron output amounted to 0,526 net tons, comparing with 4,643 in November, and 225,490 in ecember, 1952. For the full year roduction was 3,012,269 net tons gainst 2,682,065, the former record, 1952.

At the end of 1953 Canada had blast furnaces, of which 12 were owing. At the end of 1952 there ere 15 stacks, only one of which as idle.

Production of steel ingots and cast- gs in December amounted to 305,- 430 net tons, comparing with 332,703 in November, and 306,274 in December, 1952. For the full year output was 4,115,469 net tons against 3,- 700,143 in 1952.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3115 tons, land section, contract No. 2, third tube, Lincoln tunnel, Port of New York Authority, New York city, through Gull Contracting Co., to Bethlehem Steel Co., Bethlehem, Pa.

1900 tons, Medical Center buildings, Temple University, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

530 tons, one 4-span and two 3-span beam bridges, Middletown, Conn., to McDermott Steel Specialties Co., Hartford, Conn., through Alexander Jarvis Co., Manchester, Conn., general contractor; also 405 tons, steel piling, to Bethlehem Steel Co., Bethlehem, Pa.

490 tons, receiver building, General Electric Realty Co., Electronics Park, Syracuse, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

335 tons, turbo-generator supports, Connecticut Light & Power Co., Devon, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

300 tons, state bridge work, overpass, Morris county, New Jersey, to Harris Structural Steel Co., New York city.

280 tons, marginal wharf, Lincoln tunnel development, Manhattan, Port of New York Authority, New York city, through Merritt-Chapman & Scott Corp., that city, to Schacht Steel Construction Inc., New York city.

210 tons, addition and alterations, Greenpoint Savings Bank building, Brooklyn, N. Y., through Irons & Reynolds, general contractors, to Grand Iron Works, New York city.

STRUCTURAL STEEL PENDING

6900 tons, Grady Memorial Hospital, Atlanta, Ga., R. E. McKee, Texas, low on general contract.

3000 tons, double cantilever maintenance hangar, Air Force base, Portsmouth, N. H., bids Mar. 19, U. S. Engineer, Boston.

2500 tons, tower steel, Bonneville Power Administration, Portland, Oreg.; American Ligurian Co. Inc., New York, low $809,757 f.o.b. destination, material fabricated at Bremen, Germany; low domestic bid by Bethlehem Pacific Coast Steel Corp., Seattle, $829,236, f.o.b. Seattle.

2500 tons, hangar, Hanscomb Air Base, Bedford, Mass.; bids Mar. 4.

1300 tons, warehouse and other facilities for the Port of Harbor Commissioners, Marine terminal, Wilmington, Del., bids Mar. 16.

1200 tons, six state bridges, route 128, Dedham-Westwood-Needham, Mass.; bids Mar. 9, Boston.

1085 tons, state thruway bridge work, Westchester county, New York, L. G. De Felies & Son Inc., and C. J. Langenfelder & Son Inc., both of North Haven, Conn., low on general contract on a joint bid.

1000 tons, four state bridges, Southeast expressway, section 3, Milton, Mass.; bids in.

300 tons, Stroehmann Bros. Bakery, Norristown, Pa., bids Mar. 3

300 tons, factory, American Meter Co., Philadelphia, bids Mar. 2.

200 tons, material for city light plant, Seattle, bids in.

200 tons, two stringer bridges, Fall River expressway, Brockton, Mass.; bids Mar. 9, Boston.

100 tons, truss bridge, Montague, Mass.; bids in.

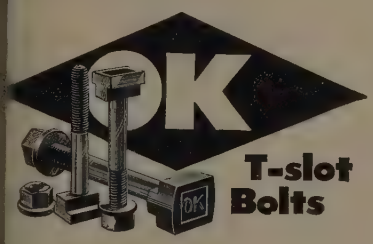
100 tons, state highway bridge, Dennis-Yarmouth, Mass.

REINFORCING BARS . . .

REINFORCING BARS PLACED

400 tons, Blanchet Catholic high school, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Strand & Sons, Seattle, general contractors.

(*Please Turn to Page* 184)



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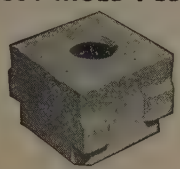

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 25	$25.50
Feb. 18	26.83
Jan. Avg.	29.05
Feb. 1953	43.00
Feb. 1949	38.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*27.00-28.00*
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*12.00-13.00*
Short shovel turnings	*16.00-17.00*
Cast iron borings	*16.00-17.00*
Cut structurals	31.00-32.00
Heavy turnings	28.00-29.00
Punchings & plate scrap	29.00-30.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	*34.00-35.00*
Charging box cast	*33.00-34.00*
Heavy breakable cast.	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast.	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	*28.50-29.50*
Rails, 2-ft. and under	*43.00-44.00*
Rails, 18-in. and under	*44.00-45.00*
Rails, random lengths	37.00-38.00
Railroad specialties	*35.00-36.00*

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*21.00-22.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*21.00-22.00*
No. 2 bundles	*17.00-18.00*
No. 1 busheling	*21.00-22.00*
Machine shop turnings	*8.00-9.00*
Mixed borings, turnings	*12.00-13.00*
Short shovel turnings	*12.00-13.00*
Cast iron borings	*12.00-13.00*
Low phos.	*24.00-25.00*
Alloy free, short shovel turnings	*15.00-16.00*
Electric furnace bundles	*21.00-22.00*

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	26.00-27.00
Stove plate	33.00-34.00
Heavy breakable cast.	22.00-23.00
Unstripped motor blocks	21.00-22.00
Brake shoes	30.00-31.00
Clean auto cast	*38.00-39.00*
No. 1 wheels	36.00-37.00
Burnt cast	27.50-28.50
Drop broken machinery	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	*26.00-27.00*
R.R. malleable	*39.00-40.00*
Rails, 2-ft. and under	42.00-43.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Cast steel	33.00-34.00
Railroad specialties	33.00-34.00
Uncut tires	35.00-36.00
Angles, splice bars	*39.00-40.00*
Rails, rerolling	*39.00-40.00*

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*22.00-23.00*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*20.00-21.00*
Machine shop turnings	*11.00-12.00*
Short shovel turnings	*16.00-17.00*
Cast iron borings	*16.00-17.00*
Low phos.	*25.00-26.00*
Electric furnace bundles	*24.00-25.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*26.00-27.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*24.00*
No. 2 heavy melting	*21.00*
No. 1 bundles	*24.00*
No. 2 bundles	*19.00*
No. 1 busheling	*24.00*
Electric furnace bundles	*25.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	18.00-19.00
Structurals & plate	*28.00*
Heavy turnings	*21.00*
Couplers, springs, wheels	30.00
Rail crops 2 ft & under	40.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Malleable	38.00-39.00
Heavy breakable cast.	36.50-37.50
Unstripped motor blocks	28.00
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*16.00-17.00**
No. 2 heavy melting	*13.00-14.00**
No. 1 bundles	*16.00-17.00**
No. 2 bundles	*11.00-12.00**
Mach. shop turnings nom	*4.00**
Mixed borings, short turnings	*7.00-8.00**
Low phos. (structural & plate)	25.00-26.00*
Short shovel turnings	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	80.00-85.00
430 sheets, clips, solids	50.00
410 sheets, clips, solids	40.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*14.00-15.00*
No. 2 heavy melting	*11.00-11.50*
No. 1 bundles	*13.00-13.50*
No. 2 bundles	*9.50-10.00*
Machine shop turnings	3.00-3.50
Mixed borings, turnings	*3.00-3.50*
Short shovel turnings	*5.50-6.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast.	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.00-23.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*22.00-23.00*
No. 2 bundles	*17.00-18.00*
No. 1 busheling	*22.00-23.00*
Machine shop turnings	*9.00-10.00*
Mixed borings, turnings	*12.50-13.50*
Short shovel turnings	*12.50-13.50*
Cast iron borings	*12.50-13.50*
Low phos., 18-in.	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast.	32.00
Charging box cast	32.00
Drop broken machinery	42.00

Railroad Scrap

No. 1 R.R., heavy melt.	*26.00-27.00*
Malleable	33.00-34.00
Rails, 18-in. and under	43.00-44.00
Rails, random lengths	*35.00-36.00*

CHICAGO

No. 1 heavy melting	*24.00-26.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 factory bundles	*26.00-27.00*
No. 1 dealer bundles	23.00-24.00
No. 2 bundles	18.00-19.00
No. 1 busheling	26.00-28.00
Machine shop turnings	9.00-10.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut structurals, 3-ft	29.00-30.00
Punchings & plate scrap	*29.00-30.00*
Electric furnace bundles	*28.00-29.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Stove plate	24.00-25.00
Unstripped motor blocks	19.00-20.00
Clean auto Cast	*33.00-34.00*
Drop broken machinery	33.00-35.00

Railroad Scrap

No. 1 R.R. heavy melt	28.00-29.00
R.R. malleable	37.00-38.00
Rails, 2-ft. and under	39.00-40.00
Rails, 18-in. and under	40.00-41.00
Angles, splice bars	34.00-36.00
Rails, rerolling	36.00-37.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	42.00
430 turnings	nom. 25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	18.00
No. 2 heavy melting	16.50
No. 1 bundles	18.00
No. 2 bundles	16.50
No. 1 busheling	18.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	*9.00*
Punchings & plate scrap	*19.00*

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	24.50-25.50
No. 2 heavy melting	21.50-22.00
No. 1 bundles	24.50-25.50
No. 2 bundles	19.50-20.00
No. 1 busheling	24.50-25.50
Machine shop turnings	12.00-13.00
Mixed borings, turnings	14.00-14.50
Short shovel turnings	*16.00-16.50*
Cast iron borings	14.00-14.50
Low phos.	28.50-29.50

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*28.50-29.50*
No. 1 machinery	*33.50-34.50*

Railroad Scrap

Rails, random lengths	31.50-32.50
Rails, 2-ft and under	36.50-37.50
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	*19.00-20.00*
No. 2 heavy melting	*17.00-18.00*
No. 1 bundles	*19.00-20.00*
No. 2 bundles	*16.00-17.00*
No. 1 busheling	*19.00-20.00*
Cast iron borings	*14.00-15.00*
Short shovel turings	*14.00-15.00*
Machine shop turings	*12.00-13.00*
Electric furnace bundles	nom.

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-3900.
Bar crops and plate	*29.00-30.00*
Structural, plate 2 ft	*29.00-30.00*
Heavy breakable cast.	30.00-31.00
Nnstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R. R. heavy melt.	nom.
Rails, 18 in. and under	*39.00-40.00*
Rails, random lengths	*33.00-34.00*
Angles, splice bars	*36.00-37.00*
Stand. steel axles	*35.00-36.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	25.00
No. 2 heavy melting	24.00
No. 1 bundles	25.00
No. 2 bundles	21.00
Machine shop turnings	7.00
Short shovel turnings	9.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	25.00
Heavy breakable cast.	25.00
Unstripped motor blocks	25.00
Brake shoes	30.00
Clean auto cast	37.00
Stove plate	27.00

Railroad Scrap

No. 1 R.R. heavy melt.	28.00
Rails, 18-in. and under	38.00
Rails, random lengths	33.00
Rails, rerolling	36.00
Uncut tires	31.00
Angles, splice bars	33.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast.	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate (f.o.b. plant)	29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast.	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00-38.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$26.00
No. 2 heavy melting	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	15.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	15.00

Cast Iron Grades†

No. 1 machinery cast.	42.00

†F.o.b., shipping point.

For High Density Bales... Use Self-Contained

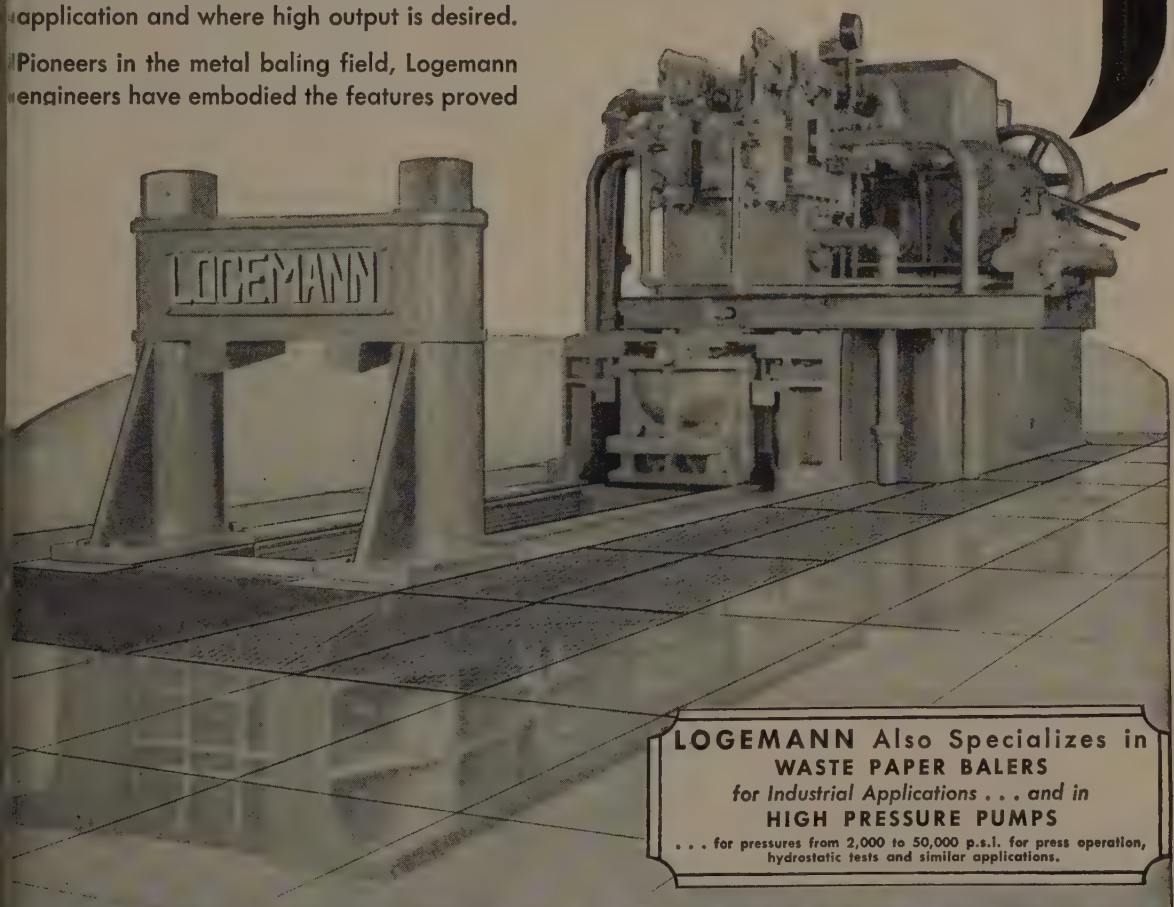
LOGEMANN Scrap Presses

Press, Pump, Tank... All in One Compact Assembly

Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

Pioneers in the metal baling field, Logemann engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. Logemann engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.



LOGEMANN Also Specializes in
WASTE PAPER BALERS
for Industrial Applications . . . and in
HIGH PRESSURE PUMPS
. . . for pressures from 2,000 to 50,000 p.s.i. for press operation, hydrostatic tests and similar applications.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

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165 tons, G. W. Hewlett high school, Hewlett, Long Island, N. Y., through Bisceglia & Son, Harrison, N. Y., general contractors, to the Jones & Laughlin Steel Corp., Long Island City, N. Y.

REINFORCING BARS PENDING

740 tons, bridge, Garden State parkway, contract No. 47, section 1, Passaic county, New Jersey, bids Mar. 15; also required will be 5500 linear feet of steel H piles and 14,600 linear feet of chain link fence.

PLATES . . .

PLATES PLACED

2370 tons, Bay Oil Co., Tiverton, R. I., to Hammond Iron Works, Warren, Pa., through J. Rich Steers Corp., New York, general contractor.

230 tons, gas tank, Socony Vacuum Oil Co., Wilmington, N. C., to Chicago Bridge & Iron Co., Chicago.

180 tons, 10 refining vessels, Texas Co., 5 to be installed at Lawrenceville, N. J., and 5 at Westville, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

PLATES PENDING

100 tons or more, replacement of wooden water storage tank with steel, Hanford Works; bids to Richland, Wash., Mar. 16.

100 tons, 250,000-gal. water tank, also 1350 ft 8-inch water pipe; bids to Vista Heights District, Marion county, Salem, Oreg., Feb. 26.

PIPE . . .

CAST IRON PIPE PLACED

2000 tons, municipal water main, Queens, New York city, Tibbets Construction Co., low on general contract with a bid of $2,224,000.

CAST IRON PIPE PENDING

250 tons, 3600 feet 20-inch, also 6500 feet of 6-inch for stockpiling; bids to Bellingham, Wash., Mar. 8.

250 tons, Eugene, Oreg., system expansion; bids in Feb. 23.

STEEL PIPE PLACED

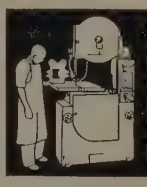
400 tons, miscellaneous sizes, Water District No. 72, Seattle, to unstated supplier.

150 tons, Alderwood Manor District, Seattle, to unstated interest; general contract to Argentieri & Colarossi, Seattle, $53,475.

RAILS, CARS . . .

RAILROAD CARS PLACED

Western Pacific, 100 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.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DI-SAWS, VARIABLE SPEED BAND SAWS, FRICTION SAWING BAND SAWS, SPECIAL SAWING MACHINERY. Write or phone
The TANNEWITZ WORKS
Grand Rapids, Mich., Ph. GL-4-1727

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AND ACCESSORIES
Largest Inventory on Pacific Coast
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OF WASHINGTON
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THREADED Rods
10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
New Haven, Conn.
Makers of H & G Die Heads

CLASSIFIED

Help Wanted

EXPERIENCED METALLURGICAL SALES ENGINEER for sales development work in connection with hot extrusion of alloys and stainless steel materials in various forms. Applicant must have good knowledge of metallurgy and have had sales contact experience. Applications confidential. Please give full details to Box 919, STEEL, Penton Bldg., Cleveland 13, Ohio.

YOUNG METALLURGIST WANTED
The Trane Company, a leading manufacturer of air conditioning, heating and heat transfer equipment, needs a graduate metallurgist with 2 to 5 years experience, preferably in the general field of brazing. Duties will include experimental development work in a liquid metals program. Excellent opportunity for advancement with rapidly growing organization. Inquiries confidential. Send resume to: The Trane Company, La Crosse, Wisconsin; Attn: D. B. Reed.

Positions Wanted

INDUSTRIAL SALESMAN, 34, college graduate, experienced direct and distributor sales to steel, metalworking and chemical processing industries. Reply Box 928, STEEL, Penton Building, Cleveland 13, Ohio.

PLANT OR PRODUCTION MANAGER. Experience covers all phases of plant operation and control, including, costs, methods improvement, incentives and labor relations. M.I.T. graduate. Reply Box 868, STEEL, Penton Bldg., Cleveland 13, Ohio.

DROP FORGE SUPERVISOR AVAILABLE—MECHANICAL ENGINEER—15-year supervision, 12-year forging engineer. Experienced in all phases of production and equipment. Employed but desire change. Reply Box 921, STEEL, Penton Bldg., Cleveland 13, Ohio.

CRACK SALESMAN with sound technical and steel production background (including stainless and super alloys), heavy on aircraft applications, strong on material flow, market analysis, and communications. Desires challenging sales or related management assignment by April 1. Reply Box 933, STEEL, Koppers Bldg., Pittsburgh 19, Pa.

MATERIALS HANDLING ENGINEER—Eighteen years' experience in industry and government. Desire position with manufacturing, warehousing or material handling equipment building organization. Capable of setting up entirely new department or taking full charge existing department. Accustomed to solving handling problems, reducing costs, conducting field surveys, preparing manuals and promotional literature. Extremely interested in equipment design. Aggressive, hard worker and willing to relocate. For complete details, write Box 932, STEEL, Penton Bldg., Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N. Y.

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built to your specifications
Take advantage of our more than 40 years' experience in manufacturing and re-building industrial transformers. *Complete satisfaction guaranteed.*
Send us your specifications for prompt quotation
"TRANSFORMER HEADQUARTERS"
Manufactured - Bought - Sold - Repaired
THE ELECTRIC SERVICE CO., INC.
5315 Hetzel St., Cincinnati 27, Ohio

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Ballast, Hart Convertible, Composite, 50-Ton
Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70'

CABOOSE CARS

Eight Wheel, Cupola Type

AUSTIN-WESTERN 30-YARD AIR DUMP CARS; STANDARD GAUGE; 50-TON, SIDE DUMP, DROP DOOR

OTHER EQUIPMENT

Jordan Spreader — Overhead Cranes
Locomotive Cranes — Railroad Track Scales

ONE ALCO STANDARD GAUGE DIESEL-ELECTRIC LOCOMOTIVE

100-TON, 600 H.P., TYPE 0-4-4-0
NEW AND RELAYING RAIL

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Phone: BEekman 3-8230

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6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

WANTED
MANUFACTURERS REPRESENTATIVES

To handle line of small rivets and screws in all metals. New York, New Jersey, Pennsylvania, West Virginia, Virginia, Tennessee, Kentucky, Indiana, Michigan, Ohio, Illinois. All western and southern states open and protected. Reply stating accounts now handled and territories covered to:

Box 927, STEEL
Penton Bldg. Cleveland 13, Ohio

WANTED
SALES MANAGER

For steel warehouse in Southern city of 200,000 population. Products handled mostly hot rolled bars, structurals, plates, etc. Logical distribution area is surrounding area of 175 miles. We are interested only if you are experienced in steel warehouse sales, completely capable of supervising outside and inside salesmen, and if you are aggressive "pusher" type. This is a wonderful opportunity and offers unlimited opportunity for the right man. If to accept this position you must leave your present job, give full details why you wish to leave. All replies held in strictest confidence. Please do not apply unless you completely fill qualifications. Write Box No. 925, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED
MALE SALES MANAGER
FOR INDUSTRIAL STEEL WAREHOUSE

LOCATION: LARGE SOUTHEASTERN CITY. MUST HAVE BACKGROUND IN STEEL DISTRIBUTION.

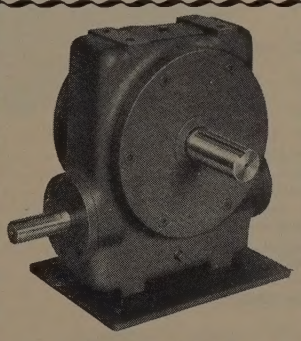
WRITE QUALIFICATIONS AND STARTING SALARY DESIRED TO:

BOX 922, STEEL
PENTON BUILDING CLEVELAND 13, OHIO

Mexican Corporation is interested in financial help to enlarge Open Hearth Furnace and financing large steel deals. Will submit good record and satisfactory reference.

Reply Box 930, STEEL
Penton Bldg. Cleveland 13, Ohio

STRUCTURAL STEEL FABRICATING PLANT, Manufacturer of Steel Industrial Buildings, has opportunity for one to three competent men. Three blocks of stock, each representing 20% interest, for sale to three highly competent men who can do an excellent job in one of the following branches: Sales; Drafting and Engineering; Administration and Finance; Expediting, Erection and Estimating. Price of each 20% interest $34,400. This is a rapidly expanding and profitable firm. Principal stockholder and general manager plans to retire in 5 years when he would sell balance of his holdings. Corporation located in Central California. Replies requested from persons fully qualified as to competence, honesty and financial resources. No window shoppers. Box No. 931, STEEL, Penton Bldg., Cleveland 13, Ohio.



DISTRIBUTORS WANTED

TO STOCK AND SELL A COMPLETE LINE OF WORM GEAR SPEED REDUCERS

in localities thruout the United States

Complete Information Upon Application

Write care of STEEL, Box 926
Penton Bldg. Cleveland 13, Ohio

WANTED:

SQUARING SHEAR

TO SHEAR UP TO ¾" THICK MINIMUM
10 FT. LONG

CAN BE USED OR REBUILT.

ADVISE YOUR OFFER TO:

GLAZER STEEL CORPORATION

1556 Tchouptioulas Street
New Orleans 13, La.

WANTED

BACKING FOR AN IMPROVED COLD DRAWING TUBE PLANT

Proposed plant to consist of one draw bench, with annealing and related equipment. It is planned to complete all cold finishing operations for one pass on

20,000 ft. of tubing in 48 working hours

or on

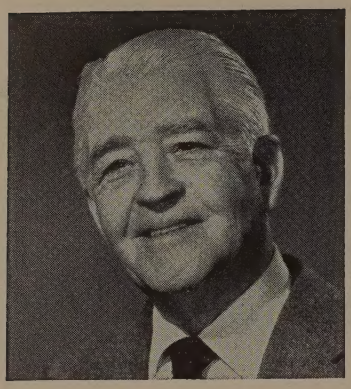
400,000 ft. of tubing in 30 days (3 shift operation).

The objectives are, a continuous flow method for quick delivery, efficient production, and a quality product. Stainless steel is preferred analysis. Process patent under study.

Write Engineer

Box 923, STEEL

Penton Bldg. Cleveland 13, Ohio



33 years ago they told me:

"YOU HAVE LESS THAN A YEAR TO LIVE!"

"MUST HAVE BEEN back in 1919 or '20. Hopeless case of diabetes. No known cure . . .

"BUT HERE I AM. They found a treatment—insulin—in time. Today, *nobody* has to die of diabetes.

"CANCER, I know, is a tougher problem. But the laboratories can lick that one, too—with our support. Already, they're curing people who would have been done for a few years ago. Last year—thanks to $5,000,000 allocated by the American Cancer Society from our contributions—they found out a lot more . . . though there's still a long way to go.

"THEY NEED MONEY, though. $5,000,000 is still less than 4 cents per American *per year*. Not enough. Not enough to find the answer *fast* enough—230,000 Americans are going to die of cancer *this year*, they say.

"I'M NOT RICH, but I gave 'em $50 last year—hope to do better this time. After all, where would *I* be if the laboratories working on diabetes, that time, hadn't been given enough support—?"

Cancer
MAN'S CRUELEST ENEMY
Strike back—*Give*

AMERICAN CANCER SOCIETY
GENTLEMEN:
☐ Please send me free information on cancer.
☐ Enclosed is my contribution of $..... to the cancer crusade.
Name.....
Address.....
City.....State.....
Simply address the envelope: CANCER c/o Postmaster, Name of Your Town

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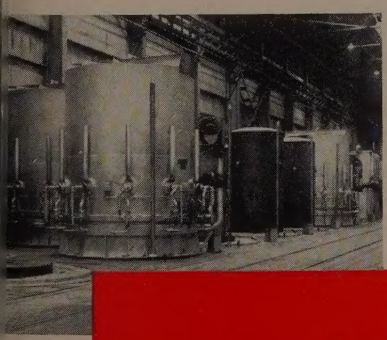
en Tons of Steel...

well-done coming up!

The chef who babies a steak to just the right degree of savoriness is no more particular or painstaking than the man who anneals the special steels that are in such demand today.

That's why the extreme accuracy and control of annealing found only in the Lee Wilson Single Stack Furnaces are becoming increasingly important to steel makers who are concerned with the quality of their product.

Ever since Lee Wilson developed the present-day method of radiant heating of metals, Wilson engineers have set the pace in annealing equipment design of which the new Single-Stack Portable-Base Convector Furnace, fitted with high efficiency "O" Tubes, is the last word. Details about this amazing new annealing system will be sent to you upon request.

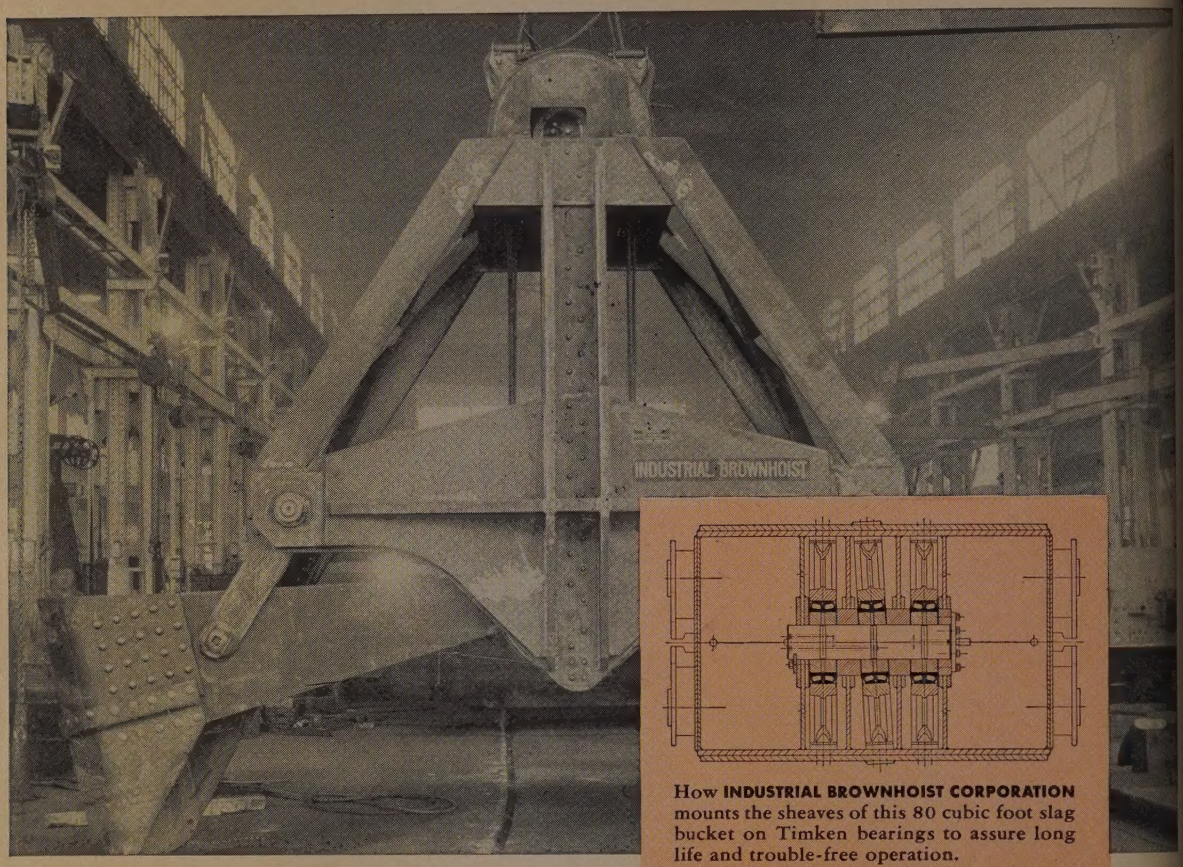


Lee Wilson

Engineering Company • Inc.

20005 West Lake Road • Cleveland 16, Ohio

How TIMKEN® bearings keep sheaves turning smoothly on 80 cubic foot slag bucket



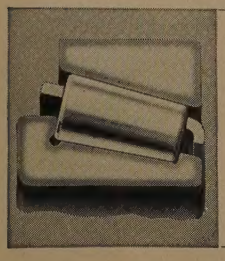
How **INDUSTRIAL BROWNHOIST CORPORATION** mounts the sheaves of this 80 cubic foot slag bucket on Timken bearings to assure long life and trouble-free operation.

WHEN this 80 cubic foot bucket scoops up slag, its sheaves have to turn smoothly. Otherwise, the bucket would be slowed down, and the cables would scuff and wear out. Industrial Brownhoist Corporation avoided both problems by mounting the sheaves on Timken® tapered roller bearings.

Timken bearings keep the sheaves rotating easily and freely because their true rolling motion and incredibly smooth surface finish practically eliminate friction. The bucket isn't slowed down—the cables don't scuff. And Timken bearings stand up under the heaviest loads because the line contact between their rollers and races gives them extra load-carrying capacity. Maintenance is reduced, wear minimized.

What's more, Timken bearings handle the tough shock loads because they're case hardened to give a tough, shock-resistant core and a hard, wear-resistant surface. Their tapered construction enables them to handle the heavy thrust loads as well as radial loads.

No other bearings give you all the advantages of Timken tapered roller bearings. Specify them for the steel mill equipment you build or buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".



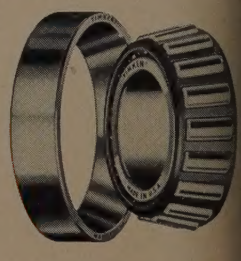
GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →✳←